

# The Mining Journal

Established 1835

Railway & Commercial Gazette

Vol. CCXLVII No. 6307

LONDON, JULY 6, 1956

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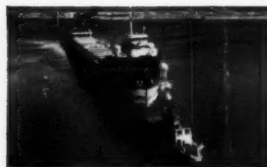
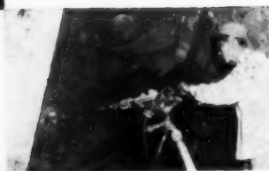
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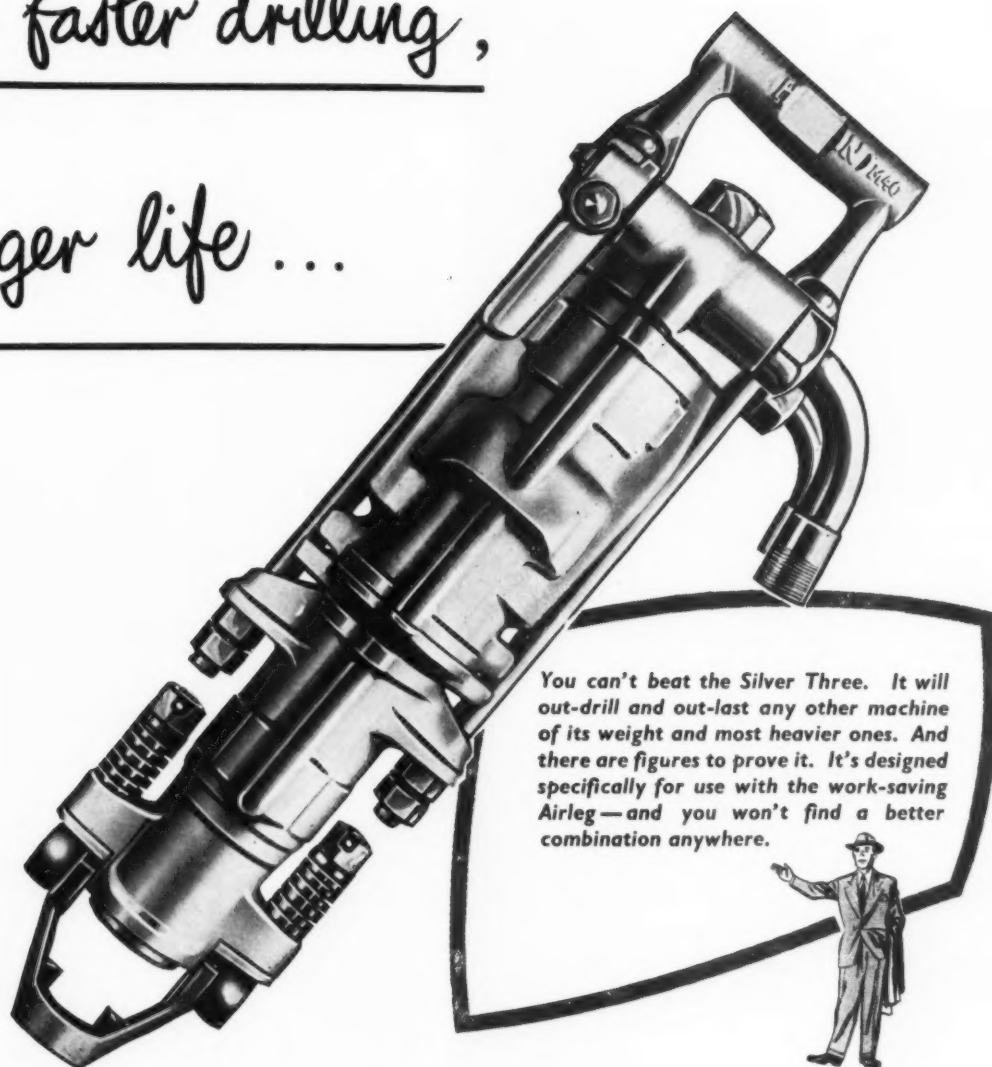
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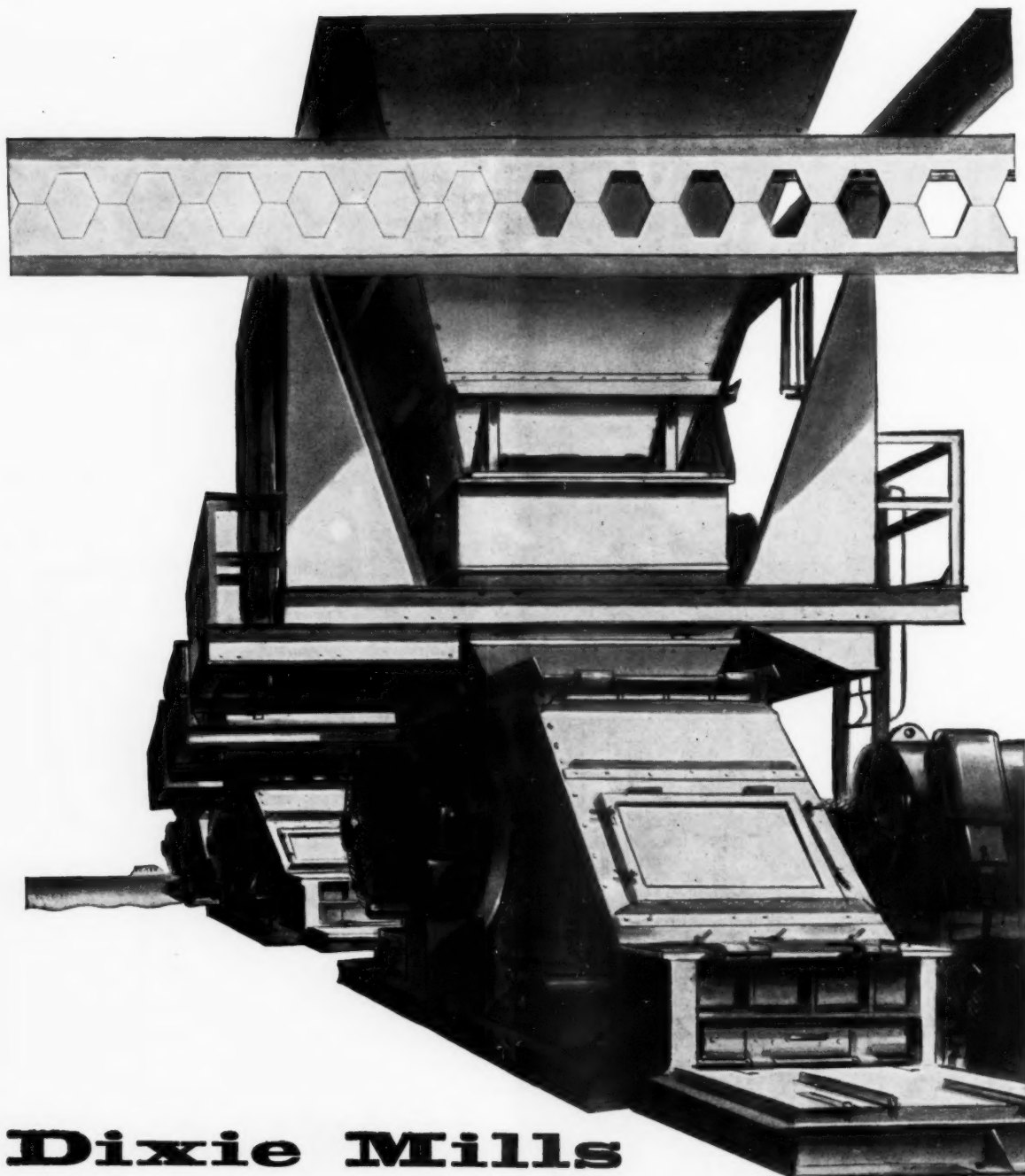
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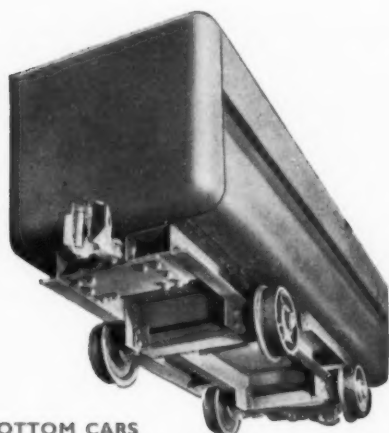
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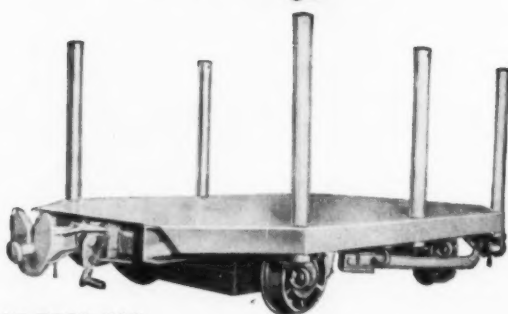




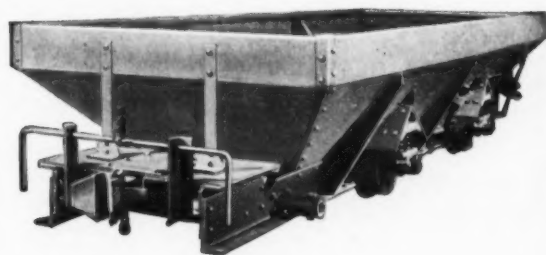
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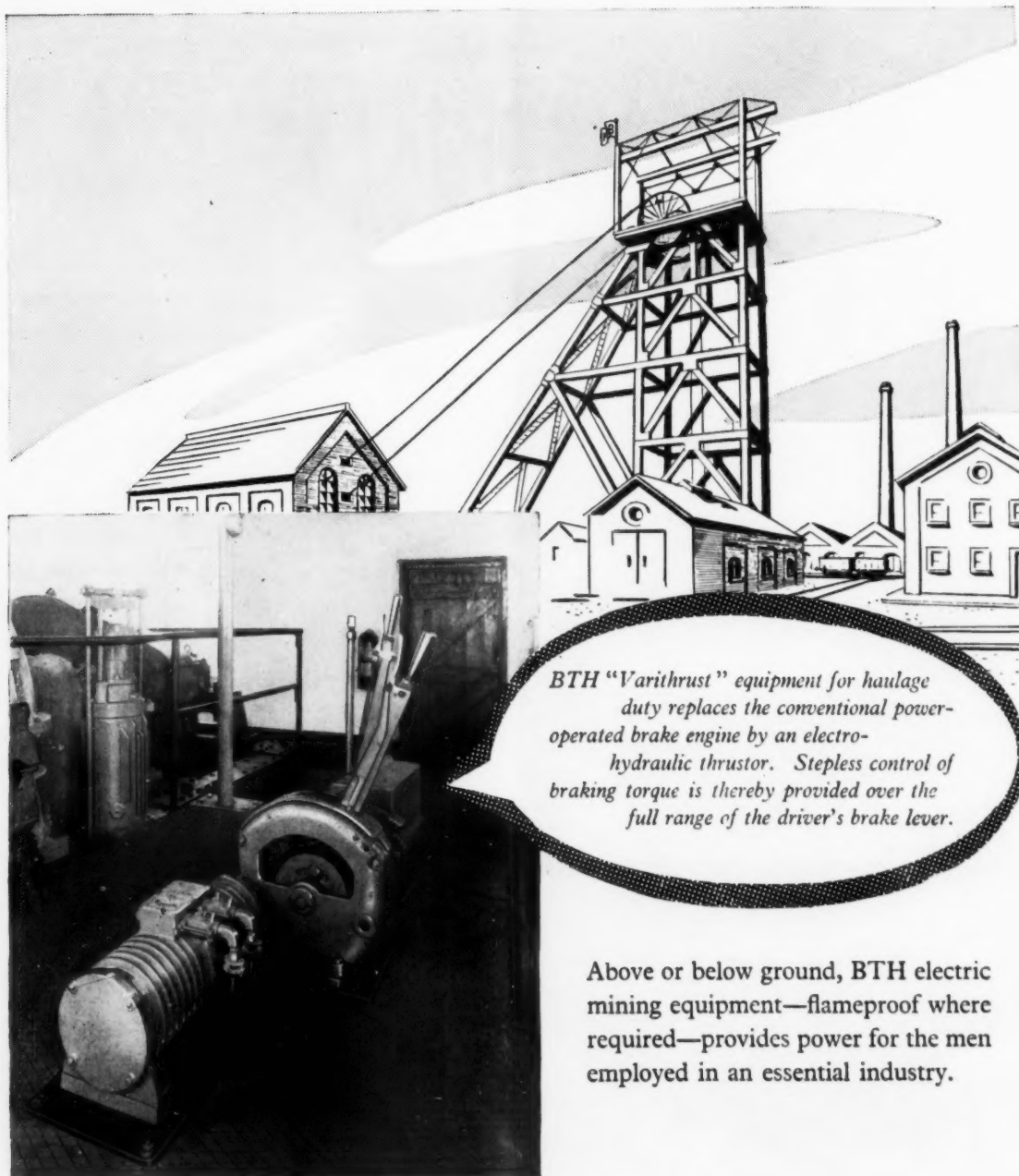
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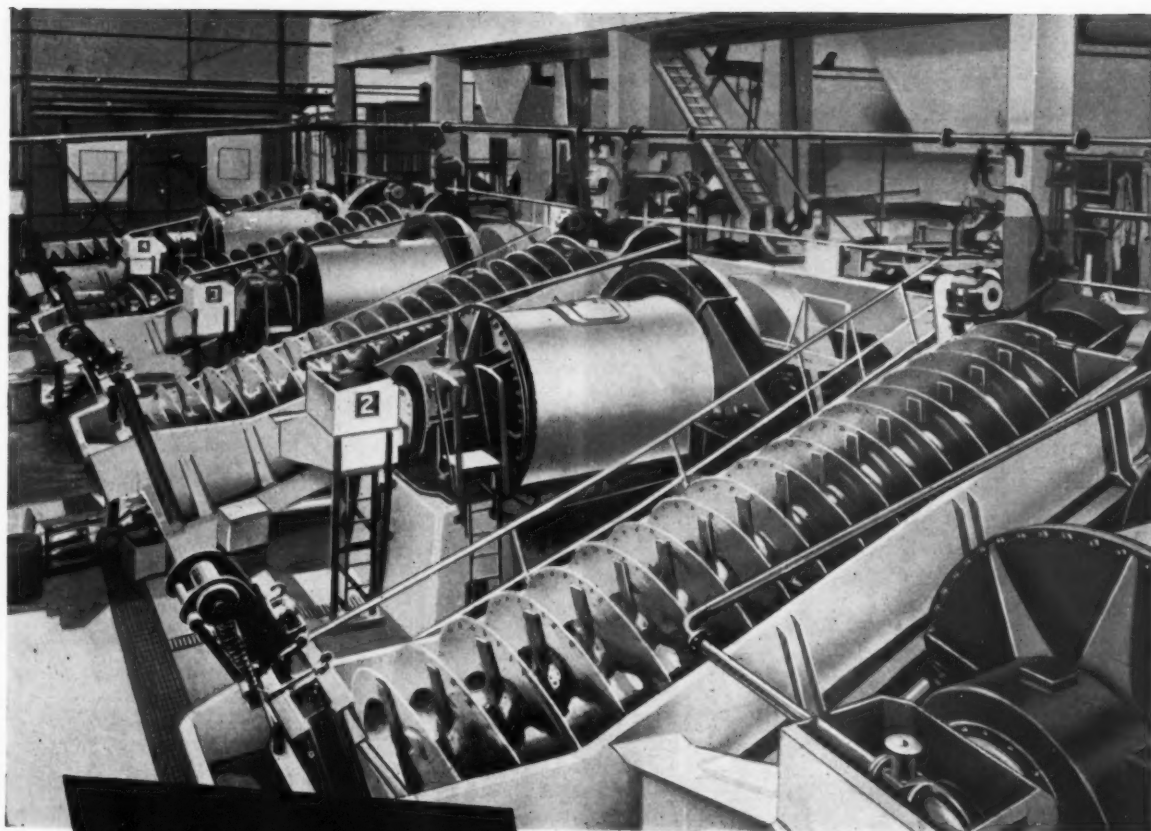
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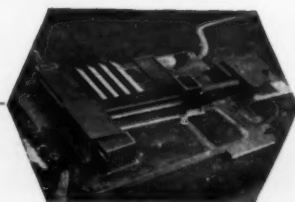
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## NOTES AND COMMENTS

### Algerian Problem Threatens N. African Mining Industry

Continued insecurity on the border between Morocco and Algeria is having a serious effect on the production of mines in the area. The Djerada anthracite mine, lead and zinc mines at Touissit and Bou Beker, and the manganese mines at Bou Arfa are the most seriously affected.

Situated in the "Oujda Corridor", which straddles the border between Morocco and Algeria, these mining establishments are at the mercy of roving rebel bands who have so intimidated native miners that production at Djerada is down to 30 per cent of normal, virtually at a standstill at Touissit and Bou Becker, and down to 55 per cent of normal at Bou Arfa.

The latter mine was the scene of a rebel attack on June 7 when four French soldiers were killed and ten wounded. At the Touissit mine there has been an almost complete stoppage since the middle of May, while intermittent strikes and chronic absenteeism at Djerada is threatening the mine with a serious crisis.

Djerada is the largest coal mine in North Africa, and with an annual output of almost half a million tons a year it is capable of satisfying all of Morocco's present needs. The Compagnie Royale Asturienne des Mines and the Société des Mines de Zellidja, which operate lead and zinc mines in the same deposit at Touissit and Bou Beker respectively, together produce nearly all the country's zinc and about 80 per cent of its lead ore. (Total production last year was 122,000 tons of lead concentrates and 78,000 tons of zinc.) The output of Bou Beker is processed at the Oued el Heimer foundry near Oujda, operated by the Zellidja-Penarroja group, which also produced 680 lb. of silver last year. If the present situation at the mine continues, the foundry also will be threatened by a stoppage when stocks of ore are exhausted.

Finally, the Société des Mines de Bou Arfa produces about 80,000 tons of manganese at 40 per cent a year, which is a little more than one-fifth of the total Moroccan

production. These mines employ approximately 6,000 men.

Since March this year, when Morocco gained its independence from France, internal security has been handed over to the native government. But the latter has been unable to impose its authority firmly on the Oujda Corridor area due to the fact that it is controlled by the so-called "liberation army", an unofficial formation of guerrillas who, although they have paid formal allegiance to the Sultan, are in fact quite beyond his control.

The result is that the liberation army rules the roost in the Oujda area and is at liberty to practice all kinds of exactions on the local population, with serious consequences for local industry.

The liberation army's activities were extended in June to Southern Morocco where it threatened to march on to the isolated oasis of Tindouf, theoretically in Algeria. But, as reported in *The Mining Journal* of May 11, some Moroccan nationalists claim Tindouf belongs to Morocco, together with the large iron ore deposits in the vicinity. A post was attacked by liberation army elements, and subsequently 32 mining technicians were evacuated from Tindouf by air as an emergency measure. Among them were two oil-prospecting teams employed by the Société Languedocienne des Pétroles which has been prospecting for oil near Tindouf and Fom el Ache.

These events come at a time when the Moroccan government is giving frequent verbal assurances that security reigns in Morocco, coupled with appeals for the investment of foreign capital. The Moroccan Minister of Industry and Mines, Si Thami el Wazzani, recently toured the Oujda Corridor and visited mining installations at Oujda, Touissit, Bou Beker and Bou Arfa, and he was at pains to reassure mine operators that he would do his utmost to protect foreign capital investments. However, internal security is in the hands of Si Mohamed Laghzaoui, member of the Istiqlal Party, bitter rival of the Parti Démocrate de l'Indépendance to which Si Wazzani belongs. Moreover, the liberation army is essentially a political tool controlled



also by certain sections of the Istiqlal and used to harass the French in Algeria by supplying arms, ammunition, explosives and money to the Algerian rebels across the border. Most of the weapons, explosives and money are obtained by force from local merchants and miners, many of whom have been kidnapped and ransomed, while others are forced to pay "protection money".

Competent observers in Rabat believe this situation will continue or worsen as long as the Algerian problem has not been resolved. In the circumstances mines in the Oujda Corridor are threatened with a grave crisis.

### Dollars for Minerals

The British government's undertaking to examine the proposal made by Viscount Bruce of Melbourne for the development of raw material resources in the Commonwealth (*The Mining Journal*, 9/12/55, p. 675) was recalled by Mr. A. Chester Beatty in his statement at the recent annual meeting of Selection Trust. He emphasized that the growing tempo of industrial development and expansion throughout the world would create a grave shortage in metal supplies unless the mining industry was expanded to meet the growing demand. Referring to the constantly reiterated necessity of earning dollars by supplying goods to America, he pointed out that the Commonwealth was already by far the world's largest exporter of minerals, while the U.S. was by far the world's largest consumer. Moreover, the U.S. was rapidly depleting its own resources and was becoming increasingly dependent on the importation of minerals.

The authors of the Paley Report estimated that the demand in the U.S. would gradually increase, so that in 20 years' time the annual requirement of the more important metals was likely to be almost doubled. At current prices this would mean a gradual annual increase in expenditure up to a total increase of about £700,000,000 annually by the U.S. on the purchase of these metals less, of course, what they are able to obtain from their own resources. If even a part of this very important increase in demand could be supplied from sterling area resources, we should have greatly contributed towards the elimination of our present adverse balance with the dollar area.

As an example of the importance of mineral deposits, Mr. Beatty pointed out that last year the Northern Rhodesia Copperbelt produced 342,000 tons of copper worth £114,000,000, which amount represents either dollars saved or dollars earned. "Everybody should realize," he stated, "how much is owed to British private enterprise in carrying out the risky business of exploration which results in the discovery and development of deposits such as these."

The basic fact on which British and Commonwealth economic policy should be founded were set out very forcibly by Lord Bruce in his plea for an imaginative scheme for the development of the British Empire's resources of vital raw materials. The same points have repeatedly been made in this journal, which has consistently advocated the need for a constructive and co-ordinated approach to minerals development. However, like many other truths which seem almost self-evident, they require to be continually reasserted until at long last they are accorded tangible recognition in the form of concrete action. Mr. Beatty's observations lend powerful support to a growing demand for a more realistic minerals policy, which the Government must find it increasingly difficult to resist.

One of the foremost requirements, of course, is relief from the grievous burden of taxation, which falls with particular severity on an industry such as mining with its

heavy cost of exploration and development and its wasting assets. As pointed out in our previous issue, crippling taxation of U.K. companies in general and of overseas interests in particular is the root cause of Britain's lamentably small participation in Commonwealth development and of the growing extent to which the exploitation of material resources is being undertaken by American interests. Mr. Macmillan's pledge for tax relief for British firms pioneering in overseas countries is a welcome indication that the danger signal has at last been officially observed.

There are other aspects of minerals development which should not be overlooked. To a growing extent the Commonwealth's leading mineral producers are no longer content to serve as suppliers of raw materials to the U.S., the U.K. and Western Europe, but are setting up refineries and factories to process locally mined ores for export or domestic consumption in fabricated form. It is of critical importance, therefore, that British investment and leadership should not be confined to the production of raw materials but should also be associated to the fullest possible extent with the development of secondary industries based on the more intensive exploitation of such materials within the country of origin.

A direction in which we appear to lag behind the U.S. is in the establishment of facilities for utilizing some of the newer metals which are likely to find widening horizons of application in the years ahead. For several years aircraft manufacturers in the U.K. were hampered by the absence of a titanium industry. This handicap has been brilliantly overcome by British scientists and technologists, whose efforts have resulted in the cheapest titanium metal in the world. According to the Chief Inspector of Mines in Nigeria, however, British interests still appear to be tardy in exploiting the potentialities of columbium, while we understand that at the present time facilities for processing tantalum virtually do not exist. On a laboratory scale, however, much work is being done on all the newer metals.

The Commonwealth is by far the largest source of columbite, tantalite, and the ores from which nearly all the newer materials are derived. In view of Britain's outstanding achievements in metallurgy and engineering manufacture, it can scarcely be doubted that we have the technological skill and resources to play a leading role in pioneering or expanding commercial usage of columbium, lithium and other new metals, thus adding very greatly to the dollar value of the minerals from which they are derived.

Having regard to the promising future which appears to be indicated for a number of these remarkable metals, the mining industry may well find it expedient to expand its markets by becoming more actively interested in accelerating the development of commercial applications.

### Fifty Years of Vanadium

Fifty years have elapsed since the discovery of the world's largest known deposit of vanadium, situated at Minas Ragra in the Andes Mountains at an elevation of 16,500 ft. From this mine, which is owned by the Vanadium Corporation of America, came 55 per cent of the entire world supply prior to 1910.

Though world production is still on a relatively small scale, vanadium is of critical importance to industry and defence. Vanadium steels have outstanding resistance to fatigue and shock, while ferro-vanadium confers upon steel a remarkably uniform grain size which is retained through successive heats, thus greatly increasing the hardening capacity of the material. When vanadium and molybdenum are used together, a steel can be made that has most of



the characteristics of a tungsten steel. This combination is finding wide use for high-speed tool steels. Some 90 per cent of the vanadium consumed is used in the production of high-speed steels and special alloy steels.

A comparatively new and highly important development is the use of vanadium as a catalyst in the manufacture of sulphuric acid by the contact process in place of the much more expensive platinum. Minor quantities of vanadium salts are used in printing fabrics, in dyeing processes, and in paints and medicines. Another outlet is in the refining of petroleum and it is understood that vanadium is also of importance in the field of atomic power.

World production of vanadium, which had increased for six successive years to an all-time peak in 1954, declined about 3 per cent in 1955, being estimated at 5,568 s.tons against 5,766 tons in the previous year. It is not possible, however, to obtain complete information on the quantity of vanadium recovered as by-products of iron ore, chrome ore and other raw materials.

Output last year was limited almost entirely to the U.S., Peru, and South-West Africa. The U.S. with an output of 4,983 tons, contributed about 89 per cent of the total in 1955. The centre of vanadium ore mining in the U.S. is the Colorado Plateau, where vanadium production is being undertaken as a by-product or co-product of uranium. In 1955, for the first time since the start of production in 1941, there was no recovery of vanadium from phosphate-rock mining.

Production at the famous Minas Ragra mine continued its down trend for the fourth successive year. Last year it fell to 78 s.tons (vanadium content), a decline of 60 per cent from 1954. Output was suspended in August, 1955, when the mine and plant were put on an indefinite standby basis.

Production of vanadium in lead and zinc concentrates (in terms of recoverable  $V_2O_5$ ) by the South-West Africa Co., the only producer in South-West Africa, amounted to 1,021 s.tons in 1955 compared with 1,130 tons in 1954.

At the Broken Hill lead-zinc deposit in Northern Rhodesia, vanadium is a by-product of mining the oxidized part of a lead-zinc orebody. There has been no production since 1952, but all vanadium-bearing ore has since been stockpiled.

It is reported that construction of a plant to recover the vanadium contained in the titaniferous iron ore of the Otanmäki mine in central Finland was started in the spring of 1955 and that production of vanadium pentoxide was expected to begin by mid-1956. The plant will be capable of producing about 500 tonnes of pentoxide annually.

In 1955, for the first time since 1946, statistics on consumption and stocks of vanadium products were collected by the Bureau of Mines. The production of ferro-vanadium more than doubled last year, but the Bureau of Mines is not at liberty to publish the output figures. Consumption amounted to 1,453 s.tons. Consumption of vanadium ores and concentrates in making vanadium pentoxide rose to the new peak of 5,752 s.tons compared with 5,074 tons in 1954, while consumption of vanadium oxide during the year amounted to 128 tons.

The growing world demand for vanadium is indicated by the phenomenal expansion of the U.S. export trade. Exports of ferro-vanadium and other vanadium alloying materials reached 220 s.tons (gross weight) compared with 70 tons in 1954; those of vanadium pentoxide, vanadic oxide, vanadium oxide and vanadates amounted to 473 tons (vanadium content) in 1955 compared with 214 tons in 1954.

It would appear that during vanadium's second fifty years, the chief factor limiting consumption will be the ability of producers to keep pace with the rising demand.

## Canada

(From Our Own Correspondent)

Blind River, June 18.

Construction and development in progress in Canada's uranium mining areas is designed to establish production facilities for an output of \$300,000,000 annually. Contracts already entered into or in course of completion involve aggregate sales of uranium oxide amounting to over \$1,300,000,000 between now and 1962. This points up the fact that uranium output is destined to take first place in point of value among the metals produced in Canada, thus placing copper and nickel in second and third places.

The Geological Survey of Canada is undertaking the busiest year so far in its history and will have 73 survey groups engaged this year, reaching into each province as well as the Yukon and the Northwest Territories. One 7-party operation will be centred in the Cassiar Mountains of northern British Columbia. Helicopters as well as conventional aircraft will be employed for service and supply.

### URANIUM PRODUCERS

Gunnar Mines, now producing some \$1,250,000 uranium oxide monthly, is planning to add about 30 per cent to its rate of output in the coming year. The company commenced production on the strength of a contract for sale of \$76,950,000 of uranium, but has now had the contract enlarged to cover whatever production may be established between now and 1962.

Consolidated Denison Mines, now building the world's largest milling plant devoted solely to the treatment of uranium ores, appears to be assured of going into production by the end of this year. A force of 1,100 men makes up the construction crew. The mill covers 10 acres and is being designed to mill 5,700 tons of ore daily, and is so laid out as to lend itself to enlargement to possibly 10,000 tons daily accordingly as development proceeds. The company's initial sales contract is for \$182,250,000 uranium between now and 1962. Meantime, the indicated ore is many times greater than the tonnage required to fill the initial production contract.

### OIL, IRON ORE AND ZINC IN THE NEWS

Construction of a transcontinental pipeline has commenced, and is designed to deliver natural gas from Alberta to the industrial provinces of Ontario and Quebec within the next two years. While the construction of the pipeline itself may involve an outlay of around \$300,000,000, the completion of the line promises additional capital expenditures of at least \$500,000,000.

An increase of about 20 per cent in iron ore production is indicated for the current year, thereby suggesting an output of over 20,000,000 tons this year compared with 17,000,000 tons in 1955. This rate of increase promises to continue throughout the next 10 years by which time rate of production will have been more than doubled.

Mineral Exploration Corp. is making plans for construction of a zinc smelter in Eastern Canada, on either the Canso Strait or the Sydney locations in Cape Breton. The tentative plan is for a smelter with a capacity of 150 tons of zinc per day, involving a capital outlay of \$25,000,000.

Metals and minerals coming from Canadian mines as revealed during the five months ended May 31 show a general increase over all former records. Copper output is running at a rate of over 31,000 tons per month. Nickel production is exceeding 15,000 tons per month. Zinc output has risen to over 36,000 tons per month.

## NICKEL IN CANADA—II

## Nickel Mining Operations in Canada

In our issue of June 29, 1956, the first portion of the following article described the nickel production of the Sudbury district of Ontario. The concluding instalment, appearing herewith, completes this description of the Canadian nickel industry by discussing production in other parts of the Dominion. The article is extracted from *Nickel in Canada*, a publication issued by the Canadian Department of Mines and Technical Surveys, Mines Branch. The author is W. R. McClelland, of the Mineral Resources Division.

The most important known occurrence of nickel in Quebec is the property of Eastern Metals Corporation Ltd. in the eastern part of the province in the township of Rolette, Montmagny county. Nickel was discovered on the property in 1951 and diamond drilling indicated two zones; the north, mineralized with nickel and zinc, and the south containing copper minerals and low values in nickel.

Exploration and development work on the 170 ft. level in the north zone indicates that the full width of the ore zone is 30-35 ft. with an average grade exceeding 2 per cent nickel. In 1952 the north zone was estimated to have more than 800,000 tons of ore averaging 0.81 per cent nickel and 1.32 per cent zinc. Metallurgical tests on the ore have given satisfactory results and the erection of a concentrator is planned.

## PRODUCTION IN MANITOBA

Numerous nickel occurrences have been found in Manitoba. Sherritt Gordon Mines Ltd. began the production of nickel and copper concentrates from its Lynn Lake mine in October, 1953, on completion of the 144-mile railway from Sherridon to Lynn Lake. The company's refinery at Fort Saskatchewan in Alberta was completed in June, 1954. Scheduled annual output comprises 8,500 s. tons of nickel, 4,500 tons of copper, 150 tons of cobalt, and 70,000 tons of by-product ammonium sulphate.

The Lynn Lake property is in the Granville Lake area of Northern Manitoba, 36 miles from the Manitoba-Saskatchewan border, and 120 air miles north of Sherridon. The deposit was discovered in 1941, but was not diamond drilled until 1945. Subsequent magnetometer and electromagnetic surveys and extensive diamond drilling outlined seven main orebodies containing 14,055,000 tons of ore averaging 1.22 p.c. nickel and 0.62 p.c. copper.

The initial capacity of the mill is 2,000 tons of ore per day. Nickel and copper concentrates are produced.

The Mystery Lake deposits of Manitoba are situated between the Managan and Burntwood rivers in Cross Lake Mining Division. Canadian Nickel Company, a subsidiary of INCO, is carrying out an extensive exploration and drilling programme on its property at Moak Lake. The deposits are of enormous size but the nickel content is low, ranging from 0.3 to 0.7 per cent. On an adjoining property Mystery Lake Mines Ltd. are actively exploring and diamond drilling an interesting nickel-bearing serpentinized peridotite.

Interest has been revived in the Maskwa and Oiseau River deposits of south-eastern Manitoba. Some 1,350,000 tons of ore have been indicated.

## OTHER PROVINCES

The first significant discovery of nickel in Yukon was made in 1952 in the Kluane Lake area. The property, known as the Wellgreen, is controlled by Hudson Bay Exploration and Development Co., Ltd. The minerals are pyrrhotite, chalcopyrite and pentlandite. By 1954, drilling had proved 500,000 tons of ore averaging 2.14 per cent nickel, 1.34 copper, 0.074 cobalt, 0.049 oz. of platinum

and 0.032 oz. of palladium. Exploratory work continues to give encouraging results.

Prospectors Airways Co. Ltd. holds a controlling interest in a nickel-copper prospect adjoining the Hudson Bay property. This company has also discovered a nickel-copper occurrence on White River, about 40 miles from the Wellgreen property.

Other occurrences are being explored both in the Yukon and in the Northwest Territories. Numerous nickel-copper occurrences have been reported in the northern part of Saskatchewan and at least three have been investigated in the Lac La Ronge area. In British Columbia the B.C. Nickel Mines property, about 100 miles east of Vancouver, which was partially developed before—during the 1930's—has been further explored in recent years. Development work, which was begun late in 1952, ceased in 1954 after continued exploration had failed to disclose any further appreciable new ore. Occurrences of nickel have been reported in several localities in Newfoundland, but none of these deposits appear to have economic value.

## THE RANKIN AREA

A deposit of nickel discovered in 1928 at Rankin inlet on the western shore of Hudson Bay was further explored by Rankin Inlet Nickel Mines Ltd. in 1951. An extensive diamond drilling programme carried out the following year brought the ore reserves up to 435,000 tons averaging 3.27 per cent nickel and 0.9 per cent copper, with values in platinum metals. Complete mining equipment was delivered to the property in 1953.

North Rankin Nickel Mines owns a nickel-copper-platinum property with 46 claims plus leases on adjacent 14 claims in the Rankin Inlet area. Underground development details in respect of the year 1955 are not yet available, but during 1954 the company outlined 460,000 tons of ore to 300 ft. depth grading 3.3 per cent nickel, 0.8 per cent copper, 0.03 oz. platinum, 0.06 oz. palladium plus minor amounts of cobalt and approximately 14 per cent sulphur. Surface drilling also explored other possibilities. A continuation of the development and exploration programme is planned for this mining season and there are indications that additional ore may be proved up both laterally and at depth. It is the intention to mine sufficient ore during the summer months to provide for the continual operation of the concentrating plant throughout the entire year, drawing down from the stockpile during the winter months.

Present plans include the installation of a concentration plant with a daily capacity of 250 tons of ore. The plant should be delivered by July, 1956, and should be in operation by the spring of 1957. The concentrates will be shipped by water to the Eastern Smelting and Refining Company at Chicoutime, Quebec, for smelting and subsequent sale.

Canadian Nickel Company has made a discovery of nickel at Ferguson Lake about 150 miles west of Rankin Inlet. The company holds an exploration concession covering 1,152 sq. miles and is carrying out diamond drilling and sampling operations.

# The Nigerian Mining Industry in 1955

The sixth largest producer of tin concentrates and the largest producer of columbite concentrates in the world, Nigeria has other mineral deposits which currently are being investigated. The following article, condensed from the report of the Chief Inspector of Mines for the territory, outlines those developments that took place in the Nigerian mining industry during 1955.

The production of tin ore in Nigeria is steady at around 11,000 tons per annum, but the price of the metal during 1955 gradually rose from an average of £707 per ton in the first quarter to £775 in the last quarter of the year. All Nigerian tin is exported to the United Kingdom where it is smelted in Liverpool. The grade of the ore varies between 72 per cent and 74 per cent tin metal, with an average of 72½ per cent.

Considerable reserves of tin lie at depth below flows of basalt intrusions and much difficulty has been experienced in devising a means of reaching these buried deposits. No new methods have yet been tried but different companies are considering two possible ways of tackling the problem. The first, which is the invention of a Swiss engineer who was at one time engaged in mining in Nigeria, consists essentially of sinking steel casings through the overburden down to bedrock, excavating, by means of water jets, the tin bearing wash on a radius of about 30 ft. from around the casing and then elevating it to concentrating plants at the surface.

The other possibility is to sink a vertical shaft deep into the soft bedrock and drain it by pumping, thereby strengthening it sufficiently to enable the tin to be excavated by hand and mechanical means.

## COLUMBITE PRODUCTION

The production of columbite has been steadily increasing and most of it has been exported to the United States. The bonus price offered by the United States government of 640s. per unit (there are 100 units to the 1 ton: Nigerian columbite shipping grade varies from about 65 to 70 per cent) was withdrawn in April, 1955, except in respect of advance contracts already entered into, because the government had reached the target for its stockpile of 15,000,000 lb. The market since then has been most uncertain and depends on individual sale contracts for stated shipments.

Because of the high price hitherto offered by the United States Government and the consequent difficulty of obtaining supplies, British steel producers may have been chary of developing the use of this valuable mineral, of which Nigeria provides 80 per cent of the world's supply. The total reserves of columbite, as given in the Mines Department Annual Report for 1954-55, were of the order of 60,000 tons.

The advantages of using columbium in high temperature alloys are already well known, but further investigation would be likely to open up fresh possibilities in this field. It is hoped, therefore, that the need for research will not now be neglected, particularly as the price, which ranges between about 215s. and 250s. per unit, should make columbium competitive with other alloying metals.

The Kennecott Copper Corporation of America has recently acquired a 52 per cent interest in a company operating large columbite deposits at Odegi, in Benue Province.

## OTHER MINERALS

The iron ore deposits at Agbaja, in Kabba Province, and around Enugu, have been investigated by an expert brought out by the Federal government, whose report shows that the deposits are not at the moment economically exploitable, particularly in view of the fact that Nigeria's coal is of a non-coking variety.



A water jet in use on the Jos tinfield

While "customary takers" continue to exploit the lead-zinc deposits around Zurak and Wase, in the Plateau Province, no mining has yet been started on leases taken out for lead and zinc. Development work is continuing on the leases at Abakaliki, and agreement should soon be reached regarding the provision of finance for this mine.

As in recent years, practically the only gold mining activity has been in the Western Region, where the declared production has been very small. There are many thousands of goldsmiths licensed in the Western Region and output is absorbed almost entirely within Nigeria. It is noteworthy that only gold declared on mineral returns by the mine operators pays royalty.

## PRODUCTION STATISTICS

1955 production figures for the principal ores and approximate values are given below:

Mineral	Production Tons	Approximate Value £(000)
Tin ore (Cassiterite) ...	11,254	6,000
Columbite (Columbium ore) ...	3,146	4,300
Tantalite ...	16	40
Wolframite ...	3	2.5
Kaolin ...	27	—
Lead-ore ...	16	1.3
Gold ...	881*	9

\* Troy oz.

The prospects for the tin mining industry in 1956 will be influenced by the International Tin Agreement. Whether it will be necessary to restrict production itself during 1956 will depend on world consumption, which appears to be rising slightly, and on whether such producers as Bolivia, which is a high cost producer, are able to maintain production at the prevailing prices. A Nigerian Tin Quota Committee has already been set up which will allocate, under the chairmanship of the Chief Inspector of Mines, a production and export quota to each tin mine operator in Nigeria during periods of restriction.

It is to be hoped that the interest shown by the United Kingdom in radio-active minerals may stimulate their production as additional products for export from Nigeria.



## Summer Meeting of Institution of Mining Engineers

The summer meeting of the Institution of Mining Engineers was held in Edinburgh from June 20-22 by invitation of the President and Council of the Mining Institute of Scotland, who arranged an interesting and varied programme for members and their guests.

In welcoming the Institution to Scotland Sir Edward Appleton, Principal and Vice-Chancellor of the University of Edinburgh, referred to the present-day strength and success of the profession of mining engineering, which, he stated, was largely due to the enlightened way in which it had adopted and adapted the results of science and technology. He said that in 1957 Edinburgh would be able to celebrate 50 years of mining education, for it was in 1907 that Dr. Henry Briggs became the first lecturer in mining at the Heriot-Watt College. Within a few years the mining department of the College undertook the work of organizing and providing rescue facilities for the mines in the Lothians.

The 115th general meeting of the Institution took place in Freemasons' Hall. The paper presented for discussion at the morning session was concerned very appropriately with "Problems of Coal-face Mechanization in the Scottish Coalfields," the authors being J. H. Paterson and H. H. Wilson. In the afternoon "A Study of British and Continental Methods of Colliery Blasting" was presented by R. F. McCormick and R. Westwater.

After the loyal toasts the City of Edinburgh was proposed by Mr. Robert A. Moore, O.B.E., President of the Mining Institute of Scotland and a Vice-President of the Institution, who said that the Lanarkshire fields were gradually being worked out and the coal mining centre was coming back again to the east of Scotland. In this connection Edinburgh was very well placed, since two new pits were under construction in and around the city. Bailie Matt A. Murray replied.

### TECHNIQUES AND LEADERSHIP

In proposing the toast of the Institution the Rt. Hon. Aubrey Jones, M.P., Minister of Fuel and Power, referred to the need for technical advances in the coal industry, in which there was tremendous scope for the application of new techniques. Was it too much to hope, he asked, that almost ten years after vesting we had reached bottom, and that from now on we could slowly, steadily climb upwards?

Replying to the Minister, Dr. William Reid, President of the Institution and himself an Edinburgh mining graduate, said that the Institution must be an independent body which could make its presence felt, independently of the major employers of the industry, the National Coal Board. He assured the Minister that the Institution would accept his challenge by providing professional leadership and seeking by every possible means to stimulate initiative and progress in the industry.

The health of the guests was proposed by Mr. T. A. Rogers, C.B.E., Vice-President of the Institution. The reply was given by Professor James Ritchie, C.B.E., President, Royal Society of Edinburgh.

Another notable function was the reception and dance at Freemasons' Hall, by invitation of the Lord Provost, Magistrates and Council of the City of Edinburgh.

The second and third days of the meeting were occupied by an extensive programme of visits.

## Association of Mining Electrical and Mechanical Engineers

The Association of Mining Electrical and Mechanical Engineers held their annual convention in Harrogate from June 12 to June 15. The national railway strike last year prevented the Association from convening so that more than usual interest was invested in this year's Conference. In the event, the traditionally high standards of organization were maintained and no one was disappointed. Interesting outings were arranged.

### PAPERS PRESENTED

The chief focal point about which the Convention centred were the three Papers presented.

Mr. J. D. Morton, B.Sc., A.R.T.C., M.I.Mech.E., M.I.E.E. (Director of Siemens Schukert (Great Britain) Ltd.) delivered the Presidential Address entitled "Youth and the Mining Electrical and Mechanical Engineer". In this thought provoking Paper the President reminded the Convention that in a world where too often money had become the touchstone of values, it was essential to remember that to know how to make a life was every bit as important as knowing how to make a living. To effect this objective it was necessary to provide young people entering industry with vocational guidance through training schemes which, he emphasized, did not merely mean formal instruction. Basic to the whole problem of training was an appreciation of personality.

The President also made a strong plea for the acceptance of the three year apprentice. The usual period of apprenticeship was, and still is, five years. That period, Mr. Morton said, may have been suitable for the raw child from elementary school, but surely cannot be appropriate for a boy of 15, or even 16 years of age, particularly if the full period of apprenticeship is covered by a suitable and systematic training. Thus the present position was anomalous in that age became the criterion of competence rather than knowledge.

The technical sessions of the Conference were ably covered by Mr. J. R. Cox, director and manager of the Liverpool Electric Cable Co. Ltd. and Mr. S. Winstanley, manager Mining/Marine Sales, W. T. Glover and Co. Ltd., who presented, on behalf of the Cable Makers' Association, a Paper entitled, "Colliery Cables". After focusing attention on the need for closer collaboration between the user and the manufacturer of electrical mining equipment the authors pinpointed the chief developments in colliery cables from 1911, the year the Coal Mines Act was placed on the Statute Book, to the present day. However, time and thought was given to signposting future developments which, they considered, would be considerable in colliery cable design in both materials used and in construction technique. On the other hand, no revolutionary changes were looked for in trailing and drill cable designs unless and until revision was obtained of Article 131 of the General Regulations which stated that: "Trailing cables shall not be dragged along by the machine when working."

The third and last Paper presented to the Conference was The Eighth W. M. Thornton Lecture: "Men Machines and Accidents" by Mr. J. W. Whitfield, M.A., Director of the Medical Council's Industrial Psychology Research Group. Having regard to the increasing rate of accidents amongst skilled engineering staffs in the mines and the fact that more working days were lost last year through accidents than were lost through strikes, the Paper was particularly appropriate.

# Operation of New Stage Hoist in the Orange Free State

A stage hoist, the first of its type in the world, has been installed at No. 3 shaft, Western Holdings G.M., in the Orange Free State. The main purpose of the hoist, which is described in the following article, is to defeat the numerous difficulties encountered when shaft sinking operations are in progress.

The Blair Stage Hoist is the invention of the consulting mechanical engineer to the Anglo American Corporation of South Africa Ltd., and despite the fact that at the moment it is in operation only in the O.F.S. goldfield, the device is arousing wide interest.

## FRICION TYPE OPERATION

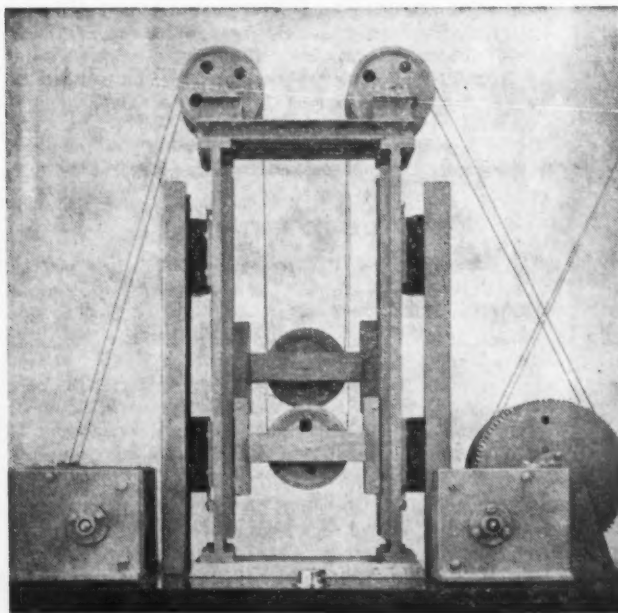
The Blair Stage Hoist differs from other winders in that it is a friction type and can be used with any diameter rope and with ropes of unlimited length, the latter feature being of great advantage. This new method makes it possible to support heavier loads to greater depths with an equal constant tension on all ropes.

Although this hoist handles two ropes only, provision is made for from two to ten ropes in the shaft to act as kibble guides in addition to supporting the stage.

## OBVIATING INCREASED TENSION

The Blair Stage Hoist was invented with the object of obviating various difficulties arising with the existing type of stage hoist where the ropes, coiled on the drum, can cause considerable trouble due to increased tension as the shaft depth increases.

The hoist has overcome these difficulties and the ropes on the drums are, at all times, not only at low tension but at constant tension irrespective of shaft depth.



A model of the Blair Stage Hoist showing the method by which rope tension is reduced



An unusual feature of the Blair hoisting arrangements in operation at Western Holdings No. 3 shaft, is the compensating tower (centre). In essence, this device is a substitute for the unusual stage hoist, and works in conjunction with a small hoist and a take-up drum capable of holding 20,000 ft. of wire rope. The whole unit is used for raising and lowering the Galloway sinking stage

To achieve the above advantages the method of operation is as follows:

The ropes supporting the stage pass over headframe sheaves (as with other winders) and proceed to the friction hoist, which, according to the number of wraps around the fleeting wheels, reduce the tension required to give the correct ratio of loading.

The hoist at Western Holdings has  $3\frac{1}{2}$  wraps which reduces rope tension from 20 tons to 2 tons and coils on drum at this loading. The tension is maintained constant by passing the ropes over a compensating tower which has the correct weight suspended.

## FUNCTION OF COMPENSATING TOWER

It is essential there be a difference in speed between the stage hoist and the drums on which the ropes are coiled; this is compensated for by the tower weights being free to move up and down as required. For example, when the stage is being raised the rope leaving the friction hoist is taken up by the weight dropping in the tower. The weight, on reaching the bottom of its travel, makes contact which automatically operates the rope drums thereby winding in the surplus rope until such time as the weight has been raised to make contact in the upper portion of the tower, which in turn stops the rope drums rotating.

The Blair Stage Hoist is a departure from all previous methods of stage handling, is less costly to install, obviates rope troubles, can be put into operation on shafts of any depth and, lastly, has proved to be most efficient.



## A Modified Technique of Shrinkage Stopping in the United States

The use of a tractor bulldozer has led to the adoption of a new technique of shrinkage stopping at the Tri-State Zinc Inc. property at Galena, United States. The bulldozers are credited with the success of the new practice, which is described in the following article.

A modified technique of shrinkage stope mining, the success of which depends on a tractor bulldozer, is now in operation at the Tri-State Zinc, Inc. mines at Galena, United States. By changing over from slushers, rail-bound equipment and can-hoisting to power shovels (diesel and electric), diesel powered crawlers and diesel trucks, output has steadily increased with only half of the former manpower. The modified technique calls for maximum flexibility. Without the tractor bulldozer, the stopes would not be accessible for jumbo drilling.

Caterpillar D7 crawler tractors smooth the surface of the broken ore piles and doze them to grade to make them accessible to tractor-mounted drill jumbos.

### THE MINING METHOD

The principal ore mineral is sphalerite. Galena, marcasite, pyrite and vein calcite commonly accompany the sphalerite. The ore lies in nearly horizontal, narrow, elongated deposits of varied size, found in dolomitic limestone of the Middle Ordovician age. A layer of highly carbonaceous shale, underlain by the McGregor (Trenton) limestone, lies beneath the ore-bearing calcareous shale. It is believed that flexures in the Trenton caused zones of weakness in the overlying shale and limestone. Solutions entering these zones of weakness took some of the limestone into solution, causing these beds to fracture and slump. These fractures gave access to the formation of ore from mineralized solutions.

At the beginning of this operation, the bulk of the ore was mined by the breast and bench stope method which necessitated considerable labour and was both expensive and hazardous. The introduction of the Caterpillar D7 tractors with bulldozers, along with other diesel crawler and rubber tyred haulage equipment, made it possible to change the method of mining the high stopes from the breast and bench system to a modified shrinkage stope method. The changeover from the former type of mining equipment and the method of mining incorporated three main advantages—increased safety, reduction in manpower and lower costs; manoeuvrability and flexibility of equipment made it possible to shift the production to any part of the mine with practically no delay; and a steadier and higher rate of production with much less effort.

The ore is drilled by four tractor-mounted drill jumbos. Tri-State installed two drill jumbos in place of the buckets on Allis-Chalmers HD5 tractor-shovels. Two Caterpillar D7 tractors with 7S dozer blades doze the broken rock piles in the stopes to grade and smooth them sufficiently for the tractor-mounted jumbos to enter all parts of the stope.

After undercutting the entire area to be stoped on the haulage level, drifts are driven longitudinally and at right angles to the orebody, leaving roughly 40 ft. spacing of pillars. Besides permitting access to subsequent stoping at numerous points, this also enables shovels to load the ore from one end of a stope, while jumbos can climb on a gradual grade from the other end. When transverse stopes are being advanced, this method gives side points from which broken ore can be drawn off.

Two types of machines are used to load the broken



A Caterpillar Diesel D7 Tractor dozes broken ore in a shrinkage stope. These machines are credited with the success of the mine

rock, an Eimco 104 1½ yd. Rocker Shovel mounted on a Caterpillar D4 tractor and electric-powered ½ yd. shovels. These loaders dump into Koehring Dumpsters and LeTourneau-Westinghouse Tournarockers for hauling the ore directly to the mill crushing plant via a 1,700 ft. adit inclined 10 per cent from the mine to the surface. The Rocker Shovel mounted on the Caterpillar D4 tractor is used in more confined areas and in development drifts.

### OTHER FACTORS

Tri-State Zinc, Inc., delivers roughly 1,050 tons of rock a day to their crushing mill. This is largely drawn from the 100,000 to 125,000 tons kept broken in the shrinkage stopes.

No exhaust scrubbers are used on the diesel engines. Excellent ventilation is provided by a 24,000 c.f.m. blower forcing air down a ventilation shaft, plus four small blowers, located on churn drill holes, that force air into development or dead end drifts. These blowers supply a combined total of 30,000 to 32,000 c.f.m. of air. The adit serves as the main exhaust.

This ventilation system has prevented the concentration of carbon monoxide or oxides of nitrogen from even closely approaching the State Mines Department's maximum allowable limits of 100 p.p.m. of carbon monoxide and 25 p.p.m. of oxides of nitrogen.

The latest news at Tri-State Zinc, Inc., is the sinking of a 1,850 ft. adit on a newly drilled orebody. This adit will also have a 10 per cent grade for diesel truck haulage.

## MACHINERY AND EQUIPMENT

### A Range of Bottom Dump Skips

Following upon the general use of overturning skips in ore mines, interest has been increasingly shown during recent years in the use of bottom discharge skips, the type used in coal mines. The main problem in both applications has been the provision of a satisfactory bottom door. The Saunders skip, manufactured by Head, Wrightson and Co., Ltd., is stated to be free from the possible defects of this type of door.

The benefits of this equipment are briefly, that because the entire weight of the contents rests on the bottom door, which is in turn supported at its back end by the hinged trunnion on the skip body and towards its front end by rollers supported from the bridle, there are no forces in operation tending to open the door during running. Other marked features are that the discharge is smooth and at the same time clean, no material remaining in the skip. Further, the ore discharge point is beyond the edge of the discharge chute to obviate spillage, while after discharge the full weight of the empty skip is always taken by the rope, thereby ensuring easy descent.

For ore mines, where it is often the practice to interchange skips and cages, the Saunders is forwarded as of marked efficiency, because the bridle can function as a Job's bridle.

### Concentrating Table Undergoing Tests

An item of information interesting to the mining industry in the United Kingdom and overseas is that the Wilfley Mining Machinery Co. have a new shaking table undergoing tests. Designated the No. 22 Concentrating Table, this machine has an improved head and deck shaking motion.

The deck will be of steel with square ends, so that production may proceed without regard to specifications stimulating left or right hand tables. The machine has been on test for over a month.

### Open Cast Mining by Bucket Excavator

A bucket excavator, designated the K100, is now operating in the bituminous coal-producing area between Most and Ervenice, Czechoslovakia. It will be recalled that previous units of this type manufactured by Orenstein-Koppel und Lubecker Maschinenbau Aktiengesellschaft, have been described in *The Mining Journal* and are operating in Australia and Germany.

The Czechoslovak machine, which weighs 1,300 tons, is operated by 34 electric motors with a total output of 980 kW., of which only 450 kW. are needed during excavation. The remaining power is used intermittently, when the machine is moving position, etc. The welded steel frame of the excavator head has eighteen buckets, each with a capacity of approximately 8/9 cu. yds. The buckets are fitted with replaceable teeth of manganese steel and with cutting edges of



Close up view of the K100 bucket excavator head

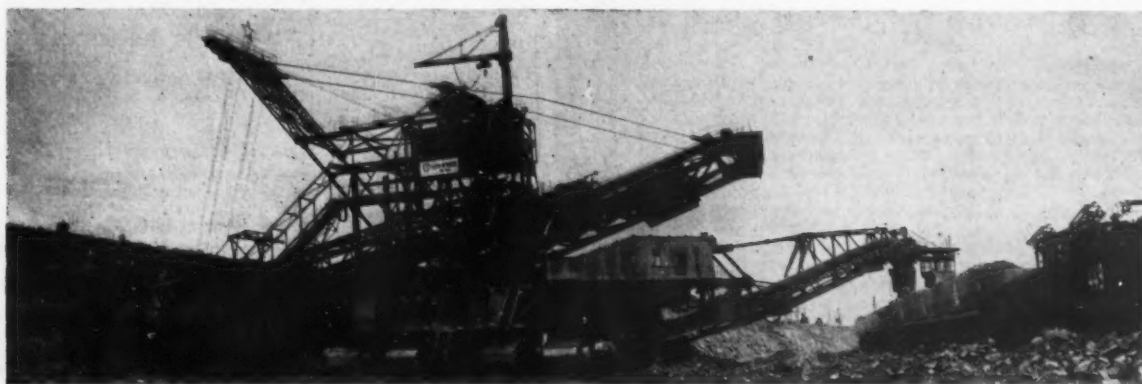
the highest quality rolled steel. This makes possible operation on harder terrains.

The unit comprises an excavator boom 112 ft. long, a loading system with a compressor unit, a discharge car, a five-ton rotating crane, a transformer station, operators' cabins, telephones and other equipment.

The K100 moves on three sets of double crawler tracks which form an equilateral triangle with a 36-ft. base. Its travelling speed is 20 f.p.m., and the smallest turning radius is approximately 132 ft. which, considering the length of the machine, 230 ft. and its height, 128 ft., is in itself a notable feature.

The excavator is operated by a crew of 12, namely the operator of the excavator head and mechanics who check the working of the main conveyor belt, the return conveyor, the loading apparatus, etc., and besides these a technical supervisor, mechanics and electricians. The machine's theoretical output is 1,425 cu. yds. per hour, but under favourable conditions it has already managed to shift 2,350 cu. yds. of soil an hour.

At the present time six giant excavators of the K100 type are operating at various locations in Czechoslovak coal regions, moving some 20,000,000 cu. yds. of overburden or soft coal a year. The machines are manufactured at the Plzeň V.I. Lenin works.



A general view of the K100 Bucket Excavator in operation at the Jan Sverna opencast mine, North Bohemia.

## MINING MISCELLANY

Officials of Finland's Otanmaeki Mining Company have left for the U.K. to negotiate continued exports of the company's ilmenite.

Brazil's National Department of Mineral Production has announced that commercially workable deposits of manganese have been found in the State of Espirito Santo.

In reply to a question in the House of Representatives, Ceylon, the Minister of Industries and Fisheries indicated that he regarded the exploitation of the ilmenite sands at Pulmoddai as a scheme which should be undertaken by the State and not by the private Sector.

An official Indian delegation, led by Mr S. Bhoothalingam, secretary to the Iron and Steel Ministry, has left for Europe to settle contracts for steel plants to be constructed in India. After visiting West Germany, the team will visit London to settle the details of the agreement with a British consortium announced earlier this year.

A representative of the British Aluminium Company, Mr. G. A. Daniels, is visiting Nigeria to investigate possibilities for opening up bauxite mining in the area. His primary aim is to determine whether bauxite exists in economic locations. He has already held talks with geological experts and mining officials in Kaduna and Jos and his programme includes visits to Eastern and Western Nigeria. Much preliminary work would be required before any decision to mine bauxite in Nigeria could be taken.

Southern Rhodesia's mineral production reached a record value of over £2,000,000 in April. The value of minerals produced in April (£2,002,889) was about £130,000 higher than the figure for March. Most of this increase was accounted for by a rise of £82,000 in the value of asbestos produced and a £34,000 increase in gold production. The total value of mineral production during the first four months of this year was more than £7,616,000, compared with just over £6,500,000 during the first four months of last year. An increase of about £218,000 in the value of asbestos produced accounted for a large proportion of this increase over the four-month period. Another big factor in the rise in production during the first four months of this year has been the coming into operation of the Mkondo copper mine, on the eastern border of Southern Rhodesia south of Umtali.

The Eire Minister for Industry and Commerce, Mr. Norton, has stated in Parliament that the establishment of a copper smelter in the Republic is under examination. There are also a number of proposals from groups other than those at present active for mineral exploratory work in various parts of the country, including counties Waterford, Cork, Kerry and Clare. He was optimistic that these proposals, which would involve an expenditure of about £200,000, would be implemented in the near future. Discussing the technical assistance project for mineral exploration, Mr. Norton said that it was intended to cover three mineralized areas. Work had been completed in two of these and the third area selected for investigation was Glendalough, County Wicklow, where there were privately owned deposits of lead and zinc.

The four-year-old British Standard for safety boots and shoes (B.S. 1870) has been revised and is now being published in two separate parts concerned with leather and rubber footwear respectively. The first part, now issued, concerns leather boots and shoes worn by (a) general industrial workers and (b) miners. Boots and shoes covered by the standard have to pass the falling weight test specified in B.S. 953. Provision is made the standard for the use of the B.S.I. certification mark, which may be applied under licence by makers whose products comply with the standard. Copies of this Standard are obtainable from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1. Price 3s.

The National Coal Board has decided that the immense task of reconstruction involved in the National Plan requires undivided attention at headquarters and that the Production Department should be able to devote themselves to the supervision of current operations. A new Reconstruction Department has therefore been set up at headquarters with the responsibility of securing that the National Plan is kept under review and adjusted as need be, and that major projects are planned and progressed with maximum speed and efficiency. Mr. H. E. Collins, C.B.E., has been appointed Director-General of Re-

construction and will take up his duties on July 16. The new department will come within the field of responsibility of Dr. W. Reid, the Board Member for Production. Dr. Reid desires to concentrate on coal production and reconstruction; the responsibility for carbonization (which he has also held) will pass to Mr. A. H. A. Wynn, the Scientific Member.

The National Coal Board has decided that the South-Eastern Division (i.e., the Kent coalfield) could in future be better administered by a general manager than, as at present, by a Divisional Board. It has special problems and difficulties, but it comprises only four collieries and is thus smaller than most of the National Coal Board Areas, which are managed by a general manager. Mr. J. H. Plumptre has been appointed as general manager of the South-Eastern Division. Mr. J. Norval, now chairman of the Divisional Board, has been appointed chairman of the executive being set up by the National Coal Board to develop and exploit the technique of underground gasification, responsibility for which has recently been passed from the Ministry of Fuel and Power to the board. Mr. H. H. Partridge is relinquishing his post as Divisional Marketing Director. The other members of the board will continue to serve in senior posts either in the South-Eastern Division or elsewhere.

### PERSONAL

Mr. H. F. Oppenheimer, joint deputy chairman of Anglo American Corporation of South Africa Ltd., has assumed the additional appointment of managing director. Mr. W. D. Wilson has been appointed assistant managing director.

Sir Charles Ponsonby, Bart., has resigned his directorship of Clutha River Gold Dredging, Ltd. Mr. Harold Edgar Barranger has been elected a director.

Major General W. W. Richards, C.B., C.B.E., M.C., has resigned from the chairmanship of East Rand Consolidated Ltd. in order to devote more time to his other interests. He remains a director of the company. Mr. C. J. Burns was unanimously elected chairman.

Mr. E. H. Browne, C.B.E., has been elected president of the Institution of Mining Engineers for 1957-58. He will succeed Dr. William Reid at the 63rd annual general meeting of the Institution to be held in London on January 31, 1957. Sir Charles Reid and Mr. Paul Weir (U.S.A.) have been elected to honorary membership of the Institution.

Mr. A. E. Morton has been appointed sales manager (Compressor Division) and publicity manager to Mackay Industrial Equipment Ltd.

Mr. G. O. Peake, O.B.E., has been appointed a director of Harrisons and Crosfield Ltd.

Industrial automation was one of the main topics of discussion at the first International Congress on Robot Science and Automation, held at Namur from June 26-29 under the auspices of the United National Educational Scientific and Cultural Organisation and the Belgian Ministry of Education.

Nearly 2,000 participants from over 50 countries attended the World Power Conference which opened in Vienna on June 17 and ended on June 23. The general theme of the conference was that of "World Energy Resources in the height of Recent Technical and Economic Developments". President of the conference was Sir Harold Hartley, with Sir Vincent de Ferranti as chairman of the executive committee.

Members from 29 Commonwealth countries and Colonial territories will attend the Study Conference on the Human Problems of Industrial Communities within the Commonwealth and Empire, to be held at Oxford from July 9 to 27. The conference will be opened by H.R. the Duke of Edinburgh in his Presidential capacity.

The Institute of Metals has changed its address to 17 Belgrave Square, London, S.W.1. Telephone Belgravia 3291. Correspondence for the Advertisement Department and the Joint Library and Information Department should be addressed to 4 Grosvenor Gardens, London, S.W.1. Telephone, Sloane 0061.



## METALS, MINERALS AND ALLOYS

**COPPER.**—The position of copper in the United States has changed little in the past week although the signs of a sizeable break in the offering are multiplying. The big producers are still quoting 46 c. per lb. and the custom smelters 40 c.—but the move cannot long be delayed. The current expectation is that a price of 40 c. will be announced as soon as Kennecott has completed its wage contracts, and that when that happens the custom smelters will immediately drop to 36 c. This forecast, however, ignores the Chileans. How the inevitable downturn is to be handled is a serious matter for Chile and the negotiations will have been difficult. The talks cannot have been helped by some of the cheerful forecasts that copper in London will go below £200 before the year is out. £200 copper would be a disaster for Chile in her present circumstances and it may be that as forecasts have become increasingly bearish, Chile has become increasingly reluctant to follow the market down without some safeguard.

Meanwhile the news that the U.K. Board of Trade would release 36,000 tons of copper in this financial year knocked a cent off number 2 scrap in New York, although the price has since recovered from 28½ to 29 c. per lb. The New York market has also had to contend with another fall in the R.S.T. quotation of £25 a ton to £275 as from July 2. The R.S.T. price has now fallen four times in around two months by a total of £110 and one is beginning to wonder how unstable a "stable" price can become. Now that there is the strong likelihood of a contango on the London market for much of the immediate future the case for price fixing becomes weaker because the facilities for hedging become so much easier.

In Rhodesia the unsettled conditions have continued. The basic cause of the many disturbances that have occurred is that the African Mineworkers' Union is dissatisfied with the fact that as Africans advance under the advancement programme they normally have to transfer to the African Staff Association. In effect this is a *volte-face* since the Mineworkers' Union had already signed an agreement accepting this fact. The classic arguments for putting men of supervisory grade in a different union are well known although in practice the problem has been solved in different ways in different industries. Nevertheless it does seem that the present policy will have the effect of draining the union of its better workers, thus at once making the rank and file a poorer lot than they are already, and making the executive even more irresponsible since there will be nobody in the rank and file to oppose it, if need be. It also means that as well as calling strikes as and when the union thinks it can get away with it, strong pressure will be put on men not to take advantage of advancement if this is going to mean that they must become staff men.

The situation is that at Rhokana the number of boss-boys on strike because they object to automatic transfer to the staff association has gone up from 50 to 200 and at Mufulira work has come to a halt. Mr. A. T. Williams, acting Governor of Northern Rhodesia has said that the strikes are illegal and has spoken of the Government's "determination to maintain law and order." Sir Roy Welensky has said: "If the security of the Federation as a whole were threatened, the Federal Government would have to consider whether it did not have a duty to intervene, which it would do through the use of its forces." It does seem from the distance of London that the Government are making heavy weather of trouble that is still incipient. No doubt that is largely the reason for the sharp rise in L.M.E. spot copper on July 4.

**LEAD.**—Lead has been quiet in the United States on the basis of 16 c. New York. The tone on London has been depressingly weak for most of the week but the confidence in the stockpiling programme both to take care of surplus American metal and to prevent dangerous stocks building up in Europe seems to have been strong enough to prevent undue worry. If the steel industry were to have a prolonged strike the matter might be different. Constructional steel is thought to be in shortest supply and if the building programme were to be held up the demand for lead would contract uncomfortably.

**TIN.**—Tin sagged in New York last week from 95 c. on June 28 to 92.87 on July 3 (there was no market on July 4). The market was affected by easier quotations in London and the East but in the last analysis it was the steel strike in the United States that was primarily responsible for the weakness the world over. How long this strike will last is still anybody's guess. Those who are optimistic pin their hopes to its fabulous cost to all concerned and to the desire of the Administration not to start the election campaign in the shadow of a strike that will be quickly felt in many sections of industry. The pessimists point to the fact that the two sides are

miles apart in their bargaining positions and that the new C.I.O.-A.F.L. combine has promised "material" support and may in its youth want to show its strength.

This weakness took place when the outlook in Malaya had clouded over again. A wildcat strike began on June 27 at Kampong Batu Gajah when 120 men struck against the employment of an "anti-union" Chinese on a dredge; next day 230 more men on another dredge struck in sympathy; miners on other dredges in the Kinta division have announced sympathetic action as from to-day. The Malayan Tin Dredging Company has threatened to sack those strikers who are not back by July 7. Meanwhile, a go-slow, which involves a complete stoppage of work on every Sunday, is due to start on July 8 and will affect 18,000 miners on European mines. This is in support of the claim for payment for rest-days back-dated to November, 1954. The Industrial Court will sit on July 18 to hear the dispute, although the union have stated that they will not necessarily accept its findings and have indicated that they would prefer either arbitration proceedings or the resumption of direct negotiations.

Malaya's contribution to the I.T.A. buffer stock will be made by the Malayan government which will be repaid by levy on the industry. The government will assist the paying of levies by loans of up to 60 per cent with interest. The scale of contributions has been fixed as follows: when the price of tin is not more than Malayan \$320 the contribution will be \$12; from \$320 to \$340 it will be \$15 and with every increase of \$20 the contribution will rise by \$3.

Latest Tin Study group figures are of especial interest as they show that, for the first four months of 1956, free-world mine production and consumption were in balance at around 52,000 tons. However, world production always tends to be relatively low during the early part of the year.

**ZINC.**—Zinc, like lead, seems likely to stay at its present price—13.50 c. per lb. East St. Louis for prime western grade—although the past week has been very quiet. At one time while dealers were waiting to see if the steel strike would materialize the market came to a standstill. Zinc is likely to feel the consequences of the steel strike much more quickly than lead but it is still too soon to say if the danger is imminent. For the present it is enough to record that the confidence in the present price is strong—from this side of the Atlantic it seems surprisingly strong. Stockpiling, and the approach of the election, are no doubt behind the feeling that the price will be protected.

**ALUMINIUM.**—Effective from July 1, a surcharge of 30s. a ton has been placed on all virgin aluminium sold in the U.K. Its purpose is to defray the cost of supplies of dear metal purchased outside Canada in order to preserve the balance between supply and demand. The purchase of non-Canadian metal at special prices became necessary as a result of the curtailment of Canadian production due to shortage of power in Quebec arising from climatic conditions during the past winter. This shortfall came at a time when demand in the U.K. was at a record level. During the past two months it has become easier and it seems probable that by the end of the year world supply and demand will be in better balance. The decision to place a surcharge of 30s. a ton on all aluminium was taken by the Aluminium Industry Council in agreement with the Board of Trade. The surcharge is expected to be a temporary measure which will be removed once the extra cost of the premium-metal has been recovered. The effective price of aluminium in the U.K. is now £190 10s. a ton.

The U.S. steel stoppage overhangs the current wage negotiations between the aluminium producers and the United Steelworkers. Union officials formally presented a list of contract demands to Alcoa at a brief meeting in Pittsburgh. The talks were then recessed until July 10. It is believed the union asked Alcoa for substantially the same benefits it requested from the steel industry—a substantial wage increase, a lay-off plan, premium pay for week-end work and other items. It is evident that these demands, if substantially granted, may have a significant impact on the price structure of the U.S. aluminium industry. Both sides have until July 31 to reach a settlement before the strike deadline.

Spurred by the ever rising requirements of the primary aluminium industry in the States, both domestic production and importation of bauxite rose to high levels during the early months of 1956 to provide an available total supply of well over 1,930,000 tons for the first quarter. The first bauxite imported into the U.S. from sources other than South American or Caribbean countries since 1952 came from Kassa

Island off the coast of French Guinea, which is now producing about 500,000 tons of bauxite annually. The bulk of this output is shipped to Canada, but Alcoa purchased some 30,000 tons of Kassa ore for the purpose of running tests to determine the commercial suitability of West African bauxite for processing in its alumina plants.

Exports of alumina and bauxite from Jamaica increased considerably last year as compared with the previous year. Alumina exports for the year ended March, 1956, totalled 166,280 tons. In the previous year the figure was 161,404 tons. Canada, Norway and Sweden are the purchasers of Jamaican alumina. Bauxite exports to March this year totalled 2,623,316 tons, as against 2,069,755 tons for the previous year.

Mining operations in Haiti to supply bauxite for Reynolds Metals will begin during the latter part of July, according to the company's president, Mr. R. S. Reynolds. They will be carried on by a newly-organized subsidiary, Reynolds Haitian Mines, of which Mr. Walter Rice, vice-president of Reynolds Metals, has been elected president. The Haitian facilities, scheduled for completion early in 1957, are designed for a regular production of 400,000 tons a year, with a reserve capacity sufficient to process 900,000 tons a year.

**COLUMBIUM.**—Despite the easier price level of the past year, Malayan columbite production is apparently increasing and is expected to exceed 300 tons this year compared with 236 tons in 1955, and only 8 in 1950.

Preliminary drilling by Gulf Oil Corporation has indicated that large tonnages of columbium ore might be readily available at a location on Nemegosenda Lake, 17 miles north-east of Chapeau in Ontario. The deposit was discovered by the Dominion Gulf Company, a Gulf subsidiary. X-ray core drilling started last July and has given extremely promising results.

**SELENIUM.**—The U.S. Government has announced that it will help to finance exploration for selenium ore by advancing up to 75 per cent of the cost of projects to obtain it. At present roughly half the U.S. supply is imported. Selenium is the thirty-fourth mineral to become eligible for financial aid since 1951, when the plan was set up.

**TITANIUM.**—The titanium plant at Witton, Birmingham, is now back in full production. It was closed a few weeks ago after an explosion in an experimental plant, the chief reason for this step being to enable extra safety precautions to be undertaken, since there had been reports of similar explosions in the U.S. The particular problems involved have now been overcome. There was a considerable stock of titanium billets in hand and the company was able to meet all orders. A report from the U.S. states that the Du Pont Co. has announced a reduction of 25 c. per lb. in all grades of titanium sponge, effective immediately.

**URANIUM.**—Professor A. B. Van Cleave, of the University of Saskatchewan, announced at the 39th annual conference of the Chemical Institute of Canada the development of a process that may open vast new fields of low-grade uranium ore to commercial exploitation. Professor Van Cleave and two colleagues have been working for the Saskatchewan Research Council since 1951 on the problems presented by vast but low-grade deposits in the Charlebois Lake area of Northern Saskatchewan, where the uranium oxide content of the ore is less than one-twentieth of 1 per cent. The process developed involves a flotation by a method which, it is believed, has not been applied to uranium ores in Canada, or possibly, the world.

## The London Metal Market

(From Our Metal Exchange Correspondent)

All markets were disturbed on Monday by a combination of unfavourable news to which was added, just before the market opened, the announcement of the U.K. government's intention to release up to 36,000 tons of copper during the present financial year; the two main industrial points were the commencement of the steel strike in the United States and the continued unrest in Rhodesia.

As the government's announcement said that the method of disposal of the metal was still to be discussed with those concerned it is impossible to form any opinion of the effect the transaction may have on the market, more especially so as it is not known whether any of the copper to be sold will have to go back to producers' agents under existing agreements, but assuming that a reasonable proportion will be sold in the open market it is very debatable whether, under present conditions, the tender method previously employed should again be used or whether the metal should be disposed of on the London Metal Exchange through its members.

In Rhodesia there are continued minor walk-outs by natives, and it is to be hoped that there will be no serious interruption to production at this time when it was to be supposed that a reasonable price level was about to be established. The steel strike has only an indirect bearing on the copper and lead positions but a direct one on those of tin and zinc.

On Monday the International Tin Council came into being, and it is understood that meetings are going on to get the mechanism set up and ready to work at the earliest possible moment, and it is possibly this development which has to some extent counteracted the effects of the steel strike. If this latter goes on, however, the lack of demand for tin in the States will undoubtedly cause a diversion of metal from Malaya to Europe with a consequent fall in the London Metal Exchange quotations. On Thursday morning the Eastern price was equivalent to £758 per ton c.i.f. Europe.

Both zinc and lead have remained relatively steady, being helped by purchases against barter agreements and the chance of further trouble in the Australian ports.

Closing prices and turnovers are given in the following table:

	June 28		July 5	
	Buyers	Sellers	Buyers	Sellers
Copper				
Cash	£283	£285	£274½	£275
Three months	£287½	£288	£274½	£275
Settlement		£285		£275
Week's turnover		4,150 tons		6,225 tons
Tin				
Cash	£742	£744	£744	£746
Three months	£738	£739	£739	£741
Settlement		£744		£746
Week's turnover		965 tons		635 tons
Lead				
Current half month	£112½	£112½	£113½	£114
Three months	£110½	£110½	£110½	£111½
Week's turnover		2,775 tons		4,250 tons
Zinc				
Current half month	£92	£92½	£92½	£93
Three months	£90½	£91	£91½	£91½
Week's turnover		3,825 tons		3,675 tons

## OTHER LONDON PRICES—JULY 5

### METALS

Aluminium, 99.5%, £190 10s. per ton	Nickel, 99.5% (home trade) £519 per ton
Antimony—	
English (99%) delivered, 10 cwt. and over £210 per ton	Osmium, £24/27 oz. nom.
Crude (70%) £200 per ton	Osmiridium, nom.
Ore (60%) bases 23s. 6d./24s. 6d. nom. per unit, c.i.f.	Palladium, £8 0s./£8 10s. oz.
Bismuth	Platinum U.K. and Empire Refined £34/£35 oz. Imported
(min. 1 ton lots) 16s. lb. nom.	£37 0s./£38 0s. oz.
Cadmium 12s. 0d. lb.	Rhodium, £42.
Chromium, 6s. 11d. lb.	Ruthenium, £15/£17 oz.
Cobalt, 21s. lb.	Quicksilver, £86/£86 10s. ex-warehouse
Gold, 250s. 2½d.	Selenium, 112s. nom. per lb.
Iridium, £29/31 oz.	Silver, 78½d. f.oz. spot and 78½ f.d.
Manganese Metal (96%-98%) £269 according to quantity	Tellurium, 15s./16s. lb.
Magnesium, 2s. 4d. lb.	

### ORES, ALLOYS, ETC.

Bismuth .. .. .	30% 5s. 3d. c.i.f.
Chrome Ore—	20% 3s. 3d. lb. c.i.f.
Rhodesian Metallurgical (semi-friable) 48%	£16 15s. 0d. per ton c.i.f.
„ Hard Lumpy (45%)	£16 5s. 0d.
„ Refractory 40%	£10 15s. 0d. per ton c.i.f.
„ Smalls 42%	£12 15s. 0d. per ton c.i.f.
Baluchistan .. .. .	£17 5s. 0d. c.i.f.
Magnesite, ground calcined ..	£28 0s./£30 0s. d/d
Magnesite, Raw (ground) ..	£21 0s./£22 0s. d/d
Molybdenite (85% basis) ..	8s. 2½d. nom. per lb. c.i.f.
Wolfram and Scheelite (65%) ..	259s. 0d./264s. 0d. c.i.f.
Tungsten Metal Powder (98% Min. W.) ..	20s. 10d. nom. per lb. (home)
Ferro-tungsten (80%-85%) ..	17s. 10d. nom. per lb. (home)
Carbide, 4-cwt. lots ..	£41 3s. 9d. d/d per ton
Ferro-manganese, home	£66 per ton
Manganese Ore Indian Europe (46%-48%) basis 125s. freight ..	103d./105d. per unit c.i.f.
Manganese Ore (43%-45%) ..	97d./98d. per unit c.i.f.
Manganese Ore (38%/40%) ..	90d./92d. per unit
Brass Wire .. .. .	2s. 10½d. per lb. basis
Brass Tubes, solid drawn ..	2s. 2½d. per lb. basis



[illegible]

figure of £121,521 (as were mineral assets at £53,000), but, book values of investments rose to £530,205 from £522,485 in addition to which current assets were substantially raised to £86,831 from £68,982.

During the past year East Rand Consolidated made total profits of £57,962 against £46,033 in 1954. This figure included the useful profit of £20,864 (£19,736) from sales of investments. After expenses and amounts written off, etc., consolidated profit was £40,475. After writing off £4,431—the difference between £1,127,932 representing the company's accumulated debit, and £1,123,501 being the amount written off under the scheme of capital reduction—an unappropriated balance of £36,044 (nil) was carried forward.

In his review to shareholders, Major General W. W. Richards stated that the company's policy was to build up investment income. In view of progress already made, he hoped that dividend payments might commence within the reasonable future. Every opportunity to effect profitable share transactions would be utilized. At June 1, 1956, the company's quoted investments had an aggregate market value of £538,510 against a book entry of £532,057. Holdings were distributed as to 28 per cent in mining finance and exploration; gold mining 58 per cent; base metal and oil 8 per cent and industrials, etc., 6 per cent. Meeting, London, July 31.

### Zandpan Borehole Results

Values have been announced by The Zandpan Gold Mining Company from Borehole Z5 situated 3,250 ft. east south east of Borehole Z1 on Farm Zandpan No. 43 in district Klerksdorp. The Vaal Reef was intersected in the original hole disclosing a value of 143 in. dwt., and the first, second and third deflections gave 74, 53, and 91 in. dwt. respectively. Core recovery was, however, incomplete in all cases and a further intersection is to be made.

### F.S. Development's Far West Rand Drilling

Presiding at the meeting of Free State Investment and Development Corporation, Mr. I. M. Campbell Rodger, stated that present activities were confined to a prospect being conducted by Johannesburg Consolidated Investment Company on the Far West Rand. While encouraging values, had, he said, been obtained from extensive drilling in this area, the programme had not yet been completed and further results must be awaited before making an assessment of potential values.

### Rand and O.F.S. Returns for June

Returns for June from South African gold and uranium mines included many encouraging features and had a favourable reception. Working profits were based upon a gold price of 249s. 1d. per ounce compared with only 248s. 8d. in May.

President Brand made a good showing with a rise of 1,000 tons in mill throughput and profits increased by some £5,000 over those of the previous month. Loraine was able to step up its crushing rate by 2,000 tons and working losses were thereby substantially reduced. At Welkom, despite a reduction of 1,500 tons, profits rose by over £7,000.

Perhaps the most outstanding return of the month came from Vaal Reefs which, following its maiden return in May,



View from the temporary steel headframe at the promising Vaal Reef mine

managed to increase its profits by nearly £20,000. The yield obtained reached 7 dwts. per ton compared with about 6½ dwts., and costs fell to the very reasonable initial level of 56s. 8d. The progress of this mine which has made such a promising start will be eagerly watched during coming months.

Another new property to make an excellent report was Hartebeestfontein. Output was stepped up by 3,000 tons and profits increased by nearly £10,000. Both Doornfontein and West Driefontein in the Gold Fields group reported increased profits. This was also the case at Blyvoor in the Central Mining group which, despite a drop in tonnage, was able to increase profits by over £6,000.

The following are the complete Rand and O.F.S. Mine returns for June:

Company	June, 1956			Current Financial Year			Last Financial Year		
	Tons (000)	Yield (oz.)	Profit† (£000)	Tons (000)	Yield (oz.)	Profit† (£000)	Tons (000)	Yield (oz.)	Profit† (£000)
<b>Goldfields</b>									
Doornfont'n	68	26,914	110-8	664	266,635	1055-9	598	213,414	1020-1
Libanon	102	22,056	53-8	1,177	256,971	662-8	1,191	250,122	1052-8
Luipaards V.	127	16,470	645-7	1,496	209,064	732-8	1,404	243,359	498-2
Rietfontein	26	5,825	17-6	156	35,353	109-5	160	36,041	122-8
Robinson	81	14,989	16-8	466	96,779	9-1	493	106,077	122-3
Simmer	102	17,627	17-2	610	105,897	93-6	711	119,389	93-6
Sub Nigel	67	20,233	67-9	796	247,185	890-3	795	259,744	1095-9
Venterspost	127	29,401	71-7	1,456	344,661	893-1	1,314	320,772	791-7
Vlaktfontein	47	16,508	81-3	249	90,248	729-2	232	81,247	440-8
Vogels	100	25,025	116-3	603	149,439	794-4	617	159,122	795-6
West Drie	71	65,821	531-8	852	714,670	5724-4	613	542,972	4277-6
<b>Anglo</b>									
<b>American</b>									
Brakpan	105	17,822	8-1	638	98,708	75-2	637	108,769	86-9
Daggas	228	51,477	290-0	1,294	294,084	1659-4	1,356	309,398	1903-7
East Daggas	97	15,807	35-0	573	94,360	213-9	576	96,137	383-7
F.S. Geduld	40	15,202	46-0	221	88,027	205-6	—	—	—
Loraine	51	9,315	116-7	398	66,904	1229-3	—	—	—
P. Brand	57	44,018	362-6	474	377,163	1099-4	—	—	—
P. Steyn	91	35,167	200-6	769	283,908	1612-0	—	—	—
S.A. Lands	92	19,735	68-0	528	106,518	324-1	569	107,287	336-4
Springs	127	15,370	9-0	754	92,058	67-5	713	94,607	47-7
Vaal Reefs	48	16,801	73-4	93	31,532	127-5	—	—	—
Welkom	86	20,351	47-5	751	131,831	243-8	—	—	—
W. Hold's	80	32,964	200-6	683	257,449	593-7	—	—	—
W. Reef Ex.	121	24,800	49-8	711	142,097	271-0	707	131,744	327-0
<b>Central</b>									
<b>Mining</b>									
Blyvoor	109	60,752	445-6	1,267	713,308	6172-8	1,257	322,758	5564-5
City Deep	153	29,597	2-0	888	172,995	15-8	948	182,328	17-3
Cons. M.R.	168	23,175	9-8	2,035	286,517	166-5	2,086	300,572	311-2
Crown	288	44,838	20-0	1,720	271,193	185-7	1,778	286,462	297-0
D. Roodep.	181	31,450	50-2	1,081	186,408	304-7	1,060	179,569	292-2
E. Rand P.P.	209	54,316	171-1	1,250	323,958	1049-3	1,266	302,262	935-1
Harmony	80	31,604	167-6	1,097	344,579	1,776-2	485	172,658	620-0
Modder East	141	14,370	7-6	1,577	165,618	79-1	1,496	166,237	188-8
Rose Deep	44	6,934	0-2	264	43,161	7-6	361	56,353	46-6
<b>J.C.I.*</b>									
E. Champ	12	863	6-5	89	5,984	36-6	119	9,272	36-3
Freddies C.	58	12,491	129-6	369	72,204	1,257-3	495	89,438	182-6
Govt. G. M.	242	29,708	113-7	1,469	180,998	107-4	1,515	196,054	285-2
Randfontein	222	20,760	105-2	1,468	142,040	611-5	1,547	173,490	548-2
<b>Union</b>									
East Geduld	148	45,516	324-5	855	264,193	1877-9	887	272,767	2052-8
Geduld Prop	104	16,608	31-2	631	94,907	205-1	606	99,280	268-9
Grootvlei	200	42,999	238-2	1,159	250,102	1359-7	1,145	247,623	1423-8
Marievale	72	18,900	87-4	423	110,995	511-1	435	109,860	525-3
St. Helena	115	33,150	181-1	606	178,723	960-1	620	147,722	726-5
Van Dyk	80	12,936	2-4	480	77,993	9-5	478	79,329	10-7
<b>General</b>									
<b>Mining</b>									
Ellatton	32	7,079	124-9	190	45,259	191-4	182	54,507	273-1
S. Roodep.	28	6,360	23-4	332	75,870	271-3	329	71,153	242-7
Stillfontein	92	35,915	1209-6	528	207,337	1222-5	501	196,887	1238-8
W. Rand C.	246	25,311	7225-8	1,401	142,862	1346-0	1,414	165,824	1325-1
<b>Anglo-</b>									
<b>Transvaal</b>									
Hartebeestfontein	66	31,614	180-2	652	293,470	1529-4	—	—	—
Merriesp't	76	18,268	50-0	302	69,886	204-1	—	—	—
N. Klerksd'p	10	1,042	82-2	64	7,459	38-3	673	8,433	4-1
Rand Leases	187	28,657	5-5	2,141	330,037	250-5	2,227	366,651	548-0
Village M.R.	34	5,073	9-0	429	60,497	111-2	413	62,024	117-7
Virginia	85	19,550	1143-3	891	194,785	1268-5	476	95,461	181-2
<b>Others</b>									
Nigel Gold	34	3,510	1-0	197	22,427	11-1	148	21,761	19-5
N. Kleinf'n	104	12,615	1-0	630	74,357	15-0	643	76,570	35-0
Saarwater	10-7	3,171	—	53-3	15,290	2-7	54-3	13,264	5-6
Wit. Nigel	19	3,986	5-9	220	45,707	91-6	215	47,623	112-3

\* Working Profit includes Sundry Revenue.

† Working Profit.

L indicates loss.

a Including Bird Reef milled 42,000 tons, recovered 1,454 oz. profit £34,300 from gold and uranium after allowing for loan repayments.

b Including uranium profit £53,000, before quarterly loan deductions of £72,000.

c After crediting £30,000 estimated uranium revenue.

d After crediting £13,505 profit from pyrite.

e After crediting £410,000 estimated net revenue from uranium and acid.

f After crediting £330,000 estimated uranium profit.

g After crediting £10,000 from uranium. Before deductions of £750.

h Excluding uranium profit declared quarterly.

i After crediting £96,958 from acid and uranium; before deducting repayments of £17,815.

k Owing to change in financial year end, previous year's figures are not comparable.

### Mid Wits and Riebeeck Shares

Speaking at the meeting of Middle Witwatersrand (Western Areas) Mr. S. G. Menell, the chairman, stated that if Riebeeck Gold Mining Company's mining lease application was granted, and its capital increased as intended, Mid Wits would be entitled to subscribe for 1,750,000 shares at par. After having satisfied the company's subparticipants it was proposed to arrange for Riebeeck to offer 715,955 shares at par to members of Mid Wits in the proportion of one Riebeeck for every 10 Mid Wits held on the appropriate date.

### Motapa's Financial Assistance

Tonnage milled by Motapa Gold Mining Company during the year ended December 31, 1955, declined by 17,600 tons from the previous year's level. A fractional increase in grade was obtained, but working costs rose by 2s. 1d. per ton milled to 32s. 5d. Of this increase, 10d. was due to the increased cost of European and Native labour, while 1s. 3d. represented higher prices of stores and sundries. The average price received for gold was 249s. 3d. per ounce compared with 247s. 8d. in 1954.

Year to Dec. 31	Ore milled (tons)	Gold produced (ozs.)	Yield per ton (dwts.)	Payable dev't* (figs.)	Ore Reserves available value (tons) (dwts.)
1955	200,200	27,905	2.8	870	290,000 3.5
1954	217,800	29,902	2.7	1,260	319,000 3.5

\* Value 3.3 dwts. per ton over 12.7 ft. (1954 - 3.6 dwts. over 9 ft.)

In his statement to shareholders, Mr. J. W. A. Wright, the chairman, referred to a suggestion made to the Government of Southern Rhodesia in July, 1955, that the latter should bear approximately half the cost of a programme of deep development. This approach was sympathetically received and culminated in a grant of financial assistance amounting to £2,250 per month payable to the company quarterly in arrear for a period of 18 months commencing January 1, 1956. This loan bears no interest, nor is there any obligation attaching to repayment.

The mine's carefully planned programme of exploration would be continued in order to ascertain the extent of payable zones of ore at depth. Mr. Wright emphasised that the future was largely dependent upon the success or otherwise of this work.

### Union Minière's Satisfactory Outlook

In his address to members of Union Minière du Haut-Katanga, Mr. E. Sengier, chairman of the Executive Committee, stated that the prospects for 1956 remained satisfactory. On June 25, he revealed, copper tonnages sold and delivered amounted to 120,000 s.tons at an average price of 45.5 c. per lb. (equivalent to about £364 per 1.ton). In view of current pressures on copper prices it is encouraging to hear that the company had done so well during the first six months of its year. Mr. Sengier also stated that 1956 production should reach approximately 240,000 s.tons of copper. This compares with about 235,000 s.tons during 1955.

In the June 22 issue of *The Mining Journal*, page 782, we stated that Union Minière's net earnings for the financial year ended December 31, 1955, amounted to 6,202,000,000 Belgian francs as against 3,362,000,000 Belgian francs for 1954. While the 1954 figure was correct, that for the past financial year was not and should have read 4,206,000,000 Belgian francs. Some interesting details were given in the report and accounts regarding production at the company's mines during 1955. Although ore treated yielded a lower metal content an appreciable increase in the tonnage crushed offset this factor and so enabled output to be substantially increased over that of the previous year. Referring particularly to the Musonoi and Ruwe deposits, it was stated that these deposits supplied 54 per cent and 31 per cent respectively of total ore mined during the year. Mr. Sengier's statement will be found on page 29 of this issue.

### Mason and Barry Expects Lower Profits for 1956

Speaking at the recent meeting of Mason and Barry, Lieut. Col. J. Cross Brown, said it was difficult to make a useful forecast for the current year due to the fact that the price of copper constituted such a major influence on the company's trading results. Since April last, he recalled, this metal had suffered a drastic fall in price and it was impossible to forecast the future trend. Working costs during 1956 would be higher owing to increased wages and higher prices of raw materials and in the circumstances, profits for 1956 might be less than those earned during 1955.

### Tanjong's Sharp Rise in Grade

The outstanding feature of Tanjong Tin Dredging's past financial year ended December 31, 1955, was the sharp rise in grade recovered. Although the amount of ground treated showed a decline from the previous year's figure, output was greatly improved.

Year to Dec. 31	Ground Treated (cu. yd.)	Output Tin Ore (tons)	Per Cubic Yard Recovery (lb.)	Yard Cost (d.)	Price Rec'd. per ton (£)
1955	4,216,100	1,118.32	.60	9.87	452
1954	4,637,100	776.09	.37	8.82	421

So far, during the first five months of the company's current financial year a total of 611 tons (395 tons) of tin ore have been produced. This is a remarkable achievement which, if maintained during the coming months, could result in an all time record production level.

Tanjong's net profit for the twelve months ended December 31, 1955, came out at £106,467 against only £31,257 previously. Dividends absorbed £106,274 (£57,144) and the balance carried forward remained virtually unchanged at £23,595 compared with £23,402. The balance sheet showed a surplus of current assets over liabilities of about £395,000.

So far Tanjong has paid two interims of 30 per cent and 40 per cent respectively for 1956. This compares with two payments of 12½ per cent for the previous year. In addition a further special capital dividend of 60 per cent has been announced. This payment is to be made out of remaining capital profits arising from the sale of the company's Sungei Luas mining leases, and will bring the total so distributed to 160 per cent. At their present price of about 20s. x.d. Tanjong 5s. shares yield an attractive 25 per cent.

Mr. A. G. Glenister is chairman. Meeting, London, July 12.

### Kinta's Better Production Rate

A greater volume of ground treated, together with a fractional rise in the recovery of tin ore per cu. yd., was responsible for an increase in production by Kinta Tin Mines during the year ended December 31, 1955.

Year to Dec. 31	Ground Treated (cu. yd.)	Output Tin Ore (tons)	Per Cubic Yard Recovery (lb.)	Yard Cost (d.)	Price Rec'd. per ton (£)
1955	1,238,300	379.12	.68	17.31	440
1954	1,170,800	351.93	.67	16.00	416

During the current year the forecast that production rates would be maintained has been more than borne out and output figures for the first five months at 167 tons show a useful rise over the previous corresponding level of 151 tons. As operations on the company's Lailang section were completed during the past financial year all plant and equipment are now concentrated at the Damak section.

Kinta Tin's profit and loss account for the year ended December 31, 1955, showed net profits of £98,248 compared with £76,678. Dividends absorbed £51,525 (£28,350) and the balance carried forward rose to £25,333 from £21,782. The company's balance sheet revealed little change in total assets which at £428,011 compared with the preceding figure of £418,130. The net liquid asset position was excellent and amounted to about £250,000. Cash balances totalled £159,947 (£149,212). At their present price of around 14s. 9d. x.d. Kinta 5s. shares yield about 25 per cent.

So far Kinta has paid two interims of 10 per cent for 1956. This compares with the previous corresponding dividends of 7½ per cent and 10 per cent for 1955. In addition, a capital repayment of 2s. has been made and also a cash distribution of 7½d. from the proceeds of a tax free capital dividend received from Tanjong Tin. A proposal for a further capital dividend of 4½d. arising from the same source is to be considered at the Meeting to be held in London, on July 12. Mr. A. G. Glenister is chairman.

### Idris Treats Better Grade Ground

A slightly better grade of ground was treated by Idris Hydraulic Tin during the year ended December 31, 1955. This, together with the greater yardage dredged, resulted in a useful rise in tin ore output.

Year to Dec. 31	Ground treated (cu. yd.)	Output tin ore (tons)	Per Cubic Yard Recovery (lb.)	Yard Cost (d.)	Price rec'd. per ton (£)
1955	533,900	309.93	1.30	32.76	428
1954	521,800	286.91	1.23	30.24	395

Net profits after taxation and all other expenses during the past year moved up to £24,104 from £21,275. After dividends



which absorbed £18,975 against £8,250 the unappropriated balance increased to £26,045 from £20,916. Balance sheet figures as at December 31 showed total assets at £259,159 (£236,881). Current assets exceeded current liabilities by about £125,200. Based upon a current share price of about 6s. 6d. this represents as much as 80 per cent of the company's market capitalisation.

Production during the first five months of the current financial year at 108½ tons has shown a moderate decline from the previous corresponding figure of 120 tons. But in view of the general managers' belief that output should be well maintained during the year, this fall should cause no great concern. So far an interim dividend of 7½ per cent (same) has been declared in respect of 1956.

At their present price of 6s. 8d. x.d. Idris 5s. shares yield nearly 21 per cent. Mr. A. G. Glenister is chairman. Meeting, London, July 11.

#### North Kalgurli Refused Emigration Permission

Treasury consent to the application by North Kalgurli (1912) for transfer of domicile from the U.K. to Western Australia has been refused. A circular regarding this matter will be sent to shareholders shortly.

#### First Call of 1s. by Kalgoorlie Southern

A first call of 1s. (Australian currency) per share on 740,900 shares of 5s. each issued in June, 1954, has been made due and payable on July 11, 1956.

#### Rooiberg Again to Pass Dividend

The Rooiberg Minerals Development Company is unable to recommend payment of a dividend in respect of the year ending June 30, 1956. It will be recalled that no dividend was paid in respect of the year 1954-55 and the latest payment was thus 50 per cent for 1953-54 on the issued ordinary capital of £200,000 in shares of £1.

Total profits for the past financial year have been estimated at £115,000. Out of this sum an amount exceeding £50,000 has been appropriated for capital expenditure and the balance used to reduce the company's debts.

## Obituary

### COL. CLIVE E. TEMPERLEY

We regret to announce the death of Col. Clive E. Temperley, executive director of Union Corporation and chairman of San Francisco Mines of Mexico.

Col. Temperley joined Union Corporation in 1926, became manager in 1937, and was appointed to the board in 1944. He was elected chairman of San Francisco Mines of Mexico in 1950. He was also on the boards of Millars' Timber and Trading Company and the Bay Hall Trust.

Col. Temperley had a distinguished military career. He joined the Rifle Brigade in 1914 and left the Army six years later with the rank of Lieutenant-Colonel. Rejoining in 1939, he commanded a company of gentlemen cadets at Sandhurst and later served with the Allied Military Government of Italy.

A brilliant mathematician, Col. Temperley was a member of the Royal Institution and was greatly interested in nuclear research.

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## SIAMESE TIN SYNDICATE

### MR. ROBERT SCOTT'S REVIEW

The Forty-Ninth Annual General Meeting of Siamese Tin Syndicate, Limited, will be held on July 23 in London.

The following is an extract from the circulated statement by Mr. Robert S. G. Scott, the chairman:—

The production for the year was 2,685 tons of tin concentrates, compared with last year's figure of 1,998 tons. Allowing for the 119 tons attributable to the newly acquired Renong and Katu companies, there has thus been a substantial improvement in production, due firstly to the fact that both the Bangrin dredges have been operating for the full year, and, secondly, to an improvement in the value of the ground treated.

Although our overall working costs have, on balance, been slightly reduced during the year, there has been an increase in Thai export duty which has rather more than offset this. As will be seen from the statistics, the net cost of production per ton metal has therefore risen. The overall average price obtained was £705 per ton metal.

The consolidated net profit for the year before taxation at £491,344 was almost double the £249,925 earned during 1954, but considerably more than half of the amount earned has had to be set aside for tax. The dividends paid and proposed account for about 66 per cent. of the balance available.

I would draw your attention to a change in the manner of dealing with our investments, referred to in Note (2) attached to the accounts. We have sold (and subsequently reinvested in) certain securities, the book loss thus realized having been written off as shown in the appropriation account; and we have further made provision (also as shown in the appropriation account) for the balance of the difference between cost and market value. The result of these operations is that investments are shown at market value instead of at cost, as hitherto. All securities held are short and medium dated, and, if held to maturity, would in aggregate realize £803,000.

### LOWLAND LEAD MINES

Development has resulted in an increase in our reserves of indicated ore to 96,000 tons at the year end and results since the end of the year have added to this figure. In view of the fact that our original estimates were based on a figure of only 70,000 tons, the significance of the increase will be appreciated.

The exploratory cross cut to the south-west has given us grounds for optimism in that it has intersected a number of veins, some of which show promise of providing new ore for development. The labour position has improved steadily; we have a sufficient number of drilling crews and the monthly development footages have shown great improvement.

We have certainly not yet reached the stage where we can say that we have a mine with an assured future, but at least the long period of preliminary expenditure is coming to an end and I have little doubt that 1956, the 50th year of our existence will show our first rewards from lead.

### ORE RESERVES IN THE FAR EAST

Our total reserves at the year end stood at approximately 127,500,000 cu. yds. estimated to contain some 30,150 tons of tin ore. This figure includes some 25,250,000 cu. yds. of the Bangrin property, the leases covering this yardage having now been issued. The area of about 8,000,000 cu. yds. mentioned in my last review was eventually abandoned, owing to the conditions attaching to the leases proving too onerous. It could, however, probably be taken up again if the position were to improve in the future.

Conditions in Thailand have remained stable during the year under review and we have continued to receive fair, reasonable, and courteous treatment from the Thai Government. Currency regulations are still in operation and work satisfactorily, though a little slowly.

The ratification of the International Tin Agreement by Indonesia has made it possible to bring the agreement into force, and it is hoped that it will become effective as from the beginning of July. In spite of a steady increase in the consumption of tin there still remains a substantial world surplus which cannot be other than a threat to the stability of tin prices, and for this and allied reasons the coming into force of the agreement must be considered timely, even though the restriction of production is unlikely to become effective until next year. Malaya has, of course, already ratified the agreement, but Thailand has so far not done so.

I believe that 1956 will be for us another reasonably satisfactory year, provided there is no substantial drop in the price of tin. I would, however, strike a note of warning concerning the trend of labour costs in Thailand, where impending legislation is likely to involve miners in substantial additional expense. Looking further ahead, I do not think there is any need for pessimism concerning the future of tin.



## FREE STATE DEVELOPMENT AND INVESTMENT CORPORATION, LTD.

(Incorporated in the Union of South Africa)

The Twelfth Annual General Meeting of Free State Development and Investment Corporation, Limited, was held on June 28, 1956, at Johannesburg. **Mr. I. M. Campbell Rodger** presided in the absence of the Chairman and, in the course of his speech, said:—

The report and accounts deal fully with the affairs of your company for the year under review and there is little that I can add to the information which they contain.

The areas over which your company owns rights in the Orange Free State are unchanged compared with its holdings at the end of the previous financial year and are set out in detail in the Directors' report and on the plan which accompanies it. These rights are being retained by your company and will be turned to account if and when opportunity occurs. No drilling or prospecting operations were undertaken by your company on its own account during the year, and its activities at the moment are confined to its contribution to and interest in the prospect which is being conducted by the Johannesburg Consolidated Investment Company, Limited, on the Far West Rand where an extensive drilling programme is in progress. Shareholders are naturally anxious to know when they are likely to receive information regarding the results which have been obtained on this prospect. I am able to state that some encouraging values have been obtained but the programme has not yet been completed and the results of further drilling must be awaited before an assessment can be made of the potential value of this area.

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## UNION MINIÈRE DU HAUT-KATANGA

The annual meeting of shareholders of the Union Minière du Haut-Katanga was held in Brussels on June 28. Mr. P. Gillet presided.

In accordance with the agenda, the meeting first approved certain alterations to the Articles of Association, in particular the change of the date of the annual meeting, now fixed to the fourth Thursday of May instead of the fourth Thursday of June; another alteration entitles the Board to decide on the payment of instalments on the profits distribution during the course of the financial year.

The accounts for the financial year ended December, 1955, were also approved.

The Profit and Loss Account for 1955, circulated to the shareholders, showed a gross profit of F6,252,723.045. After making provision for depreciation and allowing for taxation of profits and sundry charges, the available profit balance, including the amount brought forward, totalled F4,206,311.767.

From this balance, an amount of F750,000,000 was allocated to the Special Reserve and Contingencies Fund, and a sum of about F61,000,000 was carried forward. The amount left for distribution was accordingly F3,395,496,356.

The meeting fixed at F2,629.15 gross per share, i.e. after income tax F2,200 net per share, the total dividend of the year 1955. Taking into account the interim dividend of F600 paid in January 1956, this entails a complementary dividend amounting to F1,600 net per share, or F160 net per tenth of share.

Mr. Gillet informed the meeting that Mr. Godfrey C. Hutchinson had waived his director's mandate on September 22, 1955, on grounds of personal expediency, and that, on the same date, Mr. Robert Hutchinson had been temporarily appointed to succeed to him. The meeting joined with the Board to thank Mr. Godfrey C. Hutchinson for his 23 years of signal services to the Company and confirmed the appointment of Mr. Robert Hutchinson as Director of the Company.

Information was given to the Assembly by the President, concerning the base of calculation of Directors' fees.

### MR. E. SENGIER'S STATEMENT

In his address to the meeting, Mr. Edgar Sengier, Chairman of the Permanent Executive Committee, first said that the extent of the annual report reflected the Company's care for giving the shareholders as much information as possible on its activities.

Mr. Sengier stated that the year 1955 had been an outstanding year in every respect for the Union Minière. The copper production reached 235,000 metric tons and the average sale price for copper rose to 41,800 francs per ton, equivalent to 38 cents per lb, as compared with F33,600—or 30.50 cents in 1954.

### Points from the Directors' Report

Copper production has reached a new peak with 234,673 metric tons, against 223,791 tons in 1954. Cobalt output of 8,557 metric tons remained at the same level as in the previous year.

By-products are cadmium, germanium, zinc concentrates and precious metals.

Profits arising from production of uranium concentrate only represent 1.5% of the working results.

In consideration of the probable depletion by 1970 of the Prince Leopold Mine at Kipushi, which supplies the Lubumbashi Smelter, decision has been taken to open new mines in the Western area and to develop an underground deposit at

Mr. Sengier gave the following distinctive figures concerning the year's results:

	Million francs
Turnover ... ..	13,217
Net dividend ... ..	2,732
Taxes ... ..	2,873
Royalty for the Comité Spécial du Katanga (grantor of the concession) ...	313
Provisions for depreciation ... ..	900
Total capital expenditure ... ..	2,207
(including 962 millions for the Le Marinel power-station and a new power transmission line)	
Allocation to Reserve ... ..	750

The jubilee year of 1956 will see the production of the 5 millionth ton of copper since the Union Minière's establishment.

Regarding the future, Mr. Sengier stated that the recent trend of the prices for copper is likely to bring these back to a lower level, which in fact is considered as desirable for the future stability of the market.

The operation of new mines in different parts of the world is beginning to make itself felt. The consumers will be able to rebuild their stocks and a larger demand can be met more easily.

Mr. Sengier then reviewed briefly the Company's history. The mines were located in a semi-desert country, at great distance from the sea, deprived of means of communications. The nature of the ore rendered its treatment difficult while the labour supply was difficult. The results accomplished by the Company, Mr. Sengier stated, to solve all the problems which presented themselves, have been astonishing both in the technical and in the social field.

Commenting on the Katanga's position as a producer compared with that of the United States where copper consumption exceeds by half a million tons the domestic production, Mr. Sengier emphasized the fact that the Katanga's metal must be shipped overseas and that the Company's customers are dispersed all over the world. This makes it necessary to have a large commercial organization. A tonnage approaching 80,000 tons of copper is permanently spread over the world on its way to the customers and is consequently to be considered as fixed assets.

On the occasion of its fiftieth jubilee, Union Minière has invited numerous personalities to visit its installations. Katanga will appear to them as an agreeable and prosperous country, where the European and Congolese populations lead a happy life in a harmonious community based on mutual respect.

Kambove. A new copper and cobalt electrolytic plant is to be erected near the open pit mines in the Western area.

This programme will very greatly increase the need for electric power. Although an additional 1.4 million kWh per year will be available from the Le Marinel power station, to be completed in July of this year, the study of a new dam and plant on the Lualaba river, scheduled for completion by 1965, is already on hand. This will bring total electric power production to approximately 4 billion kWh annually.

The Company was also concerned with the welfare of its native labour whose standard of living was constantly improving.

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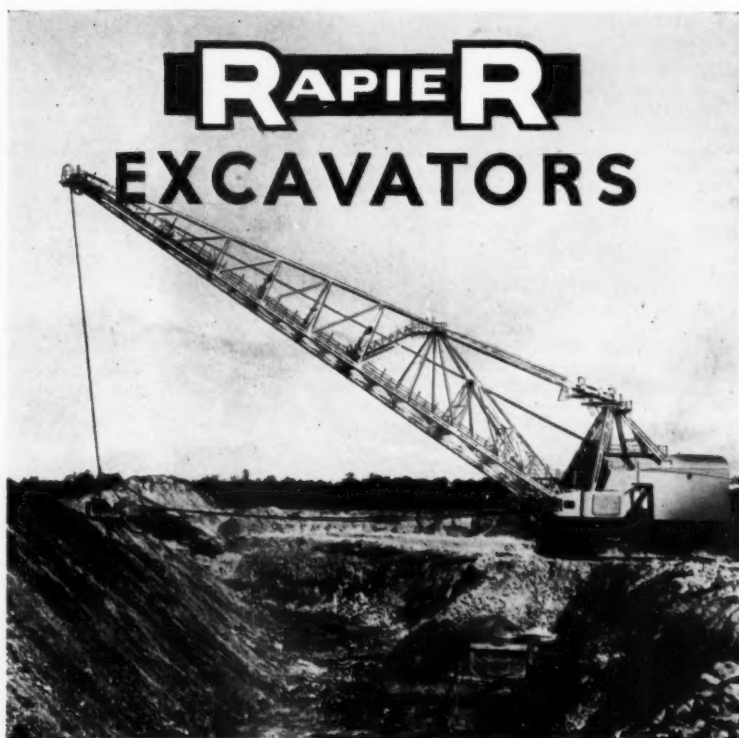
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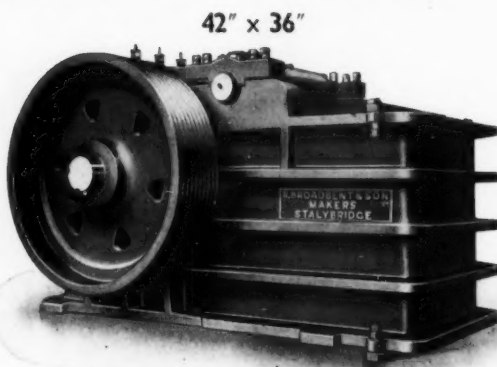
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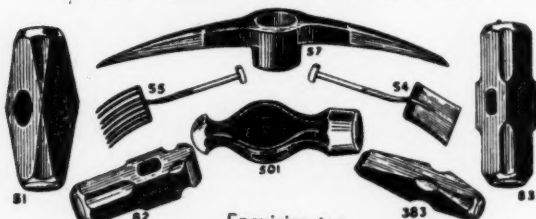
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